

# AVIATION WEEK

INCORPORATING AVIATION AND AVIATION NEWS

OCT. 20, 1947

A McGRAW-HILL PUBLICATION



## It's *Airfoam*

for comfort on the newest ships

Seats for both pilot and passengers in the new Grumman 10-passenger Mallard pictured here, like those in many new super-airliners, are cushioned with Goodyear's AIRFOAM for three very important reasons. First, this

wonder-soft latex cushioning is so superbly comfortable it lessens flying fatigue, easing strain on pilots and assuring passengers a more restful ride.

Second, its amazing durability eliminates

seat maintenance and repair—seats keep their trim look and luxurious comfort for the life of the ship. Third, an important weight saving can be effected by designing seats to take full advantage of AIRFOAM. For full information concerning this modern, lightweight, luxury cushioning, write: Goodyear, Aviation Products Division, Akron 16, Ohio or Los Angeles 54, California.



Airfoam—T.M. The Goodyear Tire & Rubber Company

MORE AIRCRAFT LAND ON GOODYEAR

TIRES TI



HONEYWELL quality is the result of close attention to every engineering detail. The spacing of electrodes in tank units of the electronic fuel pump is an example of such careful engineering. Very narrow spacing would have simplified the design job but film readings might result from condensed moisture bridging the gap between narrowly spaced electrodes.

To guarantee the accuracy of Honeywell's capacitor-type gages, Honeywell engineers already measured the largest droplets of water that could be made to cling to the

electrode surfaces, then spaced the wider electrodes 130 mils apart so water film readings would be caused by droplets bridging the gap.

This example of Creative Engineering is typical of Honeywell's effort to stop engineering less than the difference in the quality of Honeywell products. A polyetherimide gasket performance, long life, and maximum maintenance cost for the aviation industry. Minneapolis Honeywell Regulator Co., Minneapolis 8, Minnesota. In Canada: Toronto 13, Ontario.



Makers of the Aerostar in a pressurized  
Aviation Fuel System. A  
Honeywell Company.



SMART? . . . Sure he's smart. He knows there's a lot of difference between the three FORM-A-GASKETS!

FORM-A-GASKET No. 1 (a paste) sets fast but not too fast. It dries hard but not brittle. It's a swell product for making pressure-tight, leak-proof unions even when surfaces are warped.

FORM-A-GASKET No. 2 (a paste) sets a little slower than No. 1. It dries to a tough, pliable layer into which you can push your finger nail. It resists plenty of pressure—yet disassembles easily.

AVIATION FORM-A-GASKET No. 3 (a liquid) does not dry but it sets itself into position in a short time. It will not run when heated even to 400° F. Nor will it become hard and brittle at temperatures down to 70° below zero. It's a great, all-around product!

**PERMATEX COMPANY, INC.**  
**BROOKLYN 29, N. Y., U. S. A.**

**Utica Tools**  
FOR MORE TOOL MILEAGE



Pliers for  
Every Need

Ever progressive, UTICA has adopted a process of electronic hardening of the cutting edges of UTICA Tools to insure greater strength and longer life—will save tool mileage. Sold only through recognized jobbers.



Vol. 47 No. 16

# AVIATION WEEK

Oct. 20, 1947

INCORPORATING AVIATION AND AVIATION NEWS

The Aviation Week .....	7	Editorial .....	17
News Digest .....	8	Engineering - Production .....	20
Headline News .....	12	New Aviation Products .....	29
Industry Observer .....	13	Sales & Service .....	39
Aviation Calendar .....	13	Beijing for Dealers .....	43
World News .....	16	Transport .....	45
Editorial .....	17		

Robert H. Ward

Editor

Merle H. Mirkel

ASSISTANT EDITOR

Robert E. Hite	Area Editor	Albert E. Steiner, Jr.	Engineering
Dr. Irving Stone	Technical Editor	Schuyler B. Smith	Book, Book Review
William K. Krueger	Manufacturing	Katherine Johnson	Column
Alexander McMurtry	Sales & Service	Richard F. Powell	Special assignments
Charles L. Adams	Transport Editor	Stanley L. Gilbert	Production Editor
Robert McLoone	Editorial	Maxine Adams	Modeling Editor

Executive and Editorial Office: 200 W. 45th St., New York 18, N. Y.; Postpaid  
Postage: 20¢

Domestic News Bureau: Atlanta, L. B. Hedges-Harvey, 816; Chicago, 21, 220 N. Michigan Ave.; Cleveland 15, H. S. Blair; Denver, 26, P. F. Pechman, 114; Los Angeles 14, G. E. Hepp, 262; San Francisco 4, 6; St. Paul 24; Houston, 154; St. Louis 8; Correspondents: Boston, Buffalo, Dallas, Detroit, Denver, Indianapolis, Jacksonville, Kansas City, Knoxville, Louisville, Memphis, Mobile, Milwaukee, New Orleans, Oklahoma City, Spokane, Philadelphia, Phoenix, Pittsburgh, Portland (Ore.), St. Louis, St. Paul, Lake City, Wichita and 45 other cities.

Foreign News Bureau: London, Paris, Berlin, Moscow, Tokyo, Bombay, Calcutta, Rio de Janeiro, Buenos Aires, Correspondents in Athens, Caracas, Santiago, Shanghai, Zurich, East and West Germany, Stockholm and over 40 other cities.

ADVERTISING STAFF

Buster M. Koser, Seward S. Parker, William F. Easter, John D. Wilson

Robert F. Reiter

ADVERTISING

J. C. Anthony

MANAGER

Business Manager, J. G. Johnson: Art Director, Henry L. Sonderman

E. W. Moran, Jr., Sales Manager; M. J. Stas, New York; L. J. Reid, Pittsburgh; V. E. Bissell, Cleveland; A. E. Moran, Chicago; W. G. Adams, Atlanta; J. W. O'Byrne, San Francisco; C. E. McMurtry, Los Angeles. Other sales offices in Pittsburgh, Detroit, St. Louis, Boston and London.

JOHNS-MANVILLE CORPORATION, 200 W. 45th St., New York 18, N. Y. Postpaid  
Telephone: 2-2222. Postmaster: Please send address changes to 200 W. 45th St., New York 18, N. Y. Second-class postage paid at New York, N. Y., and at additional mailing offices. Copyright 1947 by Johns-Manville Corporation. All rights reserved. All rights reserved by copyright owner. All rights to name and logo are reserved by Johns-Manville Corporation.



Applying Johns-Manville Aerofelt insulation to interior of cabin. Aerofelt is easily applied.

## ... use Johns-Manville AEROFELT for both thermal and acoustical efficiency

Plane designers have found that J. M. Aerofelt insulation serves a dual purpose. In passenger cabins and crew quarters, it provides both thermal and insulation efficiency to a high degree.

Aerofelt is used extensively, too, as a thermal insulation on hot air ducts for cabin heating and anti-icing of the aircraft structure. And it has proved

particularly efficient for insulating areas where perishable goods are stored in cargo planes.

In addition to its low thermal conductivity and excellent acoustical properties, Aerofelt has extremely low moisture absorption. It is flexible, resilient and easy to handle. Under extreme vibration it holds and

maintains its shape and thickness. It will not rot, burn or support bacterial growth of any kind. It insures high performance per unit of weight.

Bulletin "J. M. Products for the Aviation Industry" gives detailed information. Write Johns-Manville, Box 236, New York 16, N. Y. for your copy.



Johns-Manville

### J-M PRODUCTS FOR THE AVIATION INDUSTRY

Packings and Sealants • Fireproof Materials  
Insulations • Asbestos Textiles • Insulated Conductors  
Transite Pipe • Industrial Building Materials

# "FLUOROSCOPE" OF YOUR AIRCRAFT'S HEART...



## PROVIDED BY NEW SPERRY ENGINE ANALYZER

■ The new Sperry Engine Analyzer will enable your flight engineer to keep his eye on the pulse of his engine—promptly visualize the slightest irregularity in engine fluoroscopy. In the analyzer's screen the flight engineer can examine at any time during flight, patterns that show the characteristics of engine vibration, ignition system performance, and synchronization between magneto and between magnet. These characteristic patterns detect, locate and identify the malfunctions and impending failures that may occur during flight operations.

■ When the airplane comes into an

airport, specific engine maintenance needs are already known. Small mechanical corrections can then be made or necessary, instead of the hours formerly required to locate the cause of malfunctions. This results in an increased number of possible flying hours per day and greater reliability in meeting schedules.



■ Our Aeronautical Department will be glad to supply complete details.



**Sperry Gyroscope Company, Inc.**

EXCLUSIVE DIVISIONS: GYRO METER • NEW YORK • DIVISION OF THE SPERRY CORPORATION  
NEW YORK • LOS ANGELES • SAN FRANCISCO • NEW ORLEANS • CLEVELAND • SEATTLE

# THE AVIATION WEEK

**BUSINESS IN THE USAF**—While public attention to the new United States Air Force has been centered on the breaking of the stars in the shuffle of the high command, more significant changes have not been at all eliminated.

Actually, USAF is now not just a status, but in the concept of its administration. This has deep roots for industry. The military will run USAF operationally. But the business end of the Department of the Air Force will be handled by business men. Although an obvious division of responsibility, this is a departure in Air Force history.

The change will be manifested principally in procurement. When the AAF was part of the War Department, AAF procurement was under the administrative supervision of the Undersecretary of War. The assistant Secretary of War for Air had no responsibility in budgetary or procurement matters. The Undersecretary of the Air Force department now assumes this function.

**SYNTHON IN SAIDLE**—The change was dictated by the statute establishing the Air Force as a separate department. But it is dictated also by the character of Air Force secretary Synthon.

A product of business, he is a convinced of the efficacy of business methods in any situation and has little patience with, or desire to, conform to usual Governmental protocol. A leader, always striving to improve procedures, he is expected to take an active interest in all facets of the Department's administration.

On the administrative side, procurement and the budget are the two main problems of Synthon's new Department. The procurement problems largely are concerned with legislation, and await Congress' action.

Promotion of procurement status for USAF, such as clothing, food and other supplies, will continue through the Army's Quartermaster Corps, and does not involve any particular difficulty. Revision of existing procurement laws to give USAF more discretion and make possible spender procurement of aircraft, and long range planning on the main items of the bill of particular Synthon likely will present to Congress.

**BUDGET WRANGLE**—AAF under the War Department was always tortured by budget problems, the attempt to reconcile its views of what was necessary with War Department plans, largely formed by general offices. The situation now is different only in degree.

Defense Secretary Forrestal, through whose office budgets for all three of the services—Army, Navy and USAF—must pass, is understood to take the attitude that as the services are equal under the law, these must be parity in appropriations.

Airpower proponents quickly point out that these can never be parity operationally (how many air forces equal one fleet, or vice versa?) and we little validity in having appropriations used for operational purposes on a legislative basis of equality.

So far, all seems well. Synthon, a polished negotiator, apparently is on excellent terms with his colleagues in the Army and Navy secretariats. Preliminary agreements on budgets has been reached, although it is always the specifics, in terms of dollars, that produce conflict.

As of now, although this may change, there is no plan to ask Congress for a supplemental USAF or Army appropriation.

**MANPOWER SHORTAGE**—While procurement and budget policy constitute the two greatest headaches of the administrative side of USAF, the operational side has its own worries. Main one is manpower. The force has an authorized strength of 55 groups. Its actual size is 15 percent greater.

USAF hopes to reach authorized strength by the first of January.

There is no worry expressed openly by USAF officers as to the character, in contrast to the size, of its operational force. To do so, in the view of critics, would be to condemn the USAF's own planning.

There is opinion that USAF is repeating the mistake made in power days when the cry was that the Air Corps, while small in numbers, was superior in quality. Any USAF representative today is drawing broads and in word broads and test models.

**THE LINE-UP**—Our present Strategic Air Force is based on the war proven B-52. There are several hundred of these operational and ready to serve. The B-52 successors—supposedly of superior performance—the B-56, B-36 and B-37 are being tested. Orders for all three aggregate less than 300.

USAF's fighter force is built around the F-80 of which more than 1,000 have delivered of orders for about 3,000. The only other known production order for jet fighters is for the P-84, involving about 700 planes. These are on order 150 P-82 twin Mustangs, only reciprocating fighter flying in USAF planes.

The World War II medium bombers will all be replaced by jet bombers.

**PICTURE OVERDRAWN**—This is perhaps a superficial and unduly harsh assessment of U.S. airpower as embodied in the United States Air Force. The true mission of the Air Force is to meet an immediate emergency can only be measured in terms of its likely operation. On that test, qualified observers rate it high.



## NEWS DIGEST

### DOMESTIC

Civil Aeronautics Administration will assume direct supervision of the Leading Edge Experiment Station at Atlanta, Calif., next Jan. 1. The station will continue to be operated by Transoceanic Air Lines under post Army-Navy CAA funds. Present equipment includes Fido, several types of high intensity lights, instrument landing systems and ground control approach systems.

Engene V. Fitchett has submitted his resignation as head of the aviation section, division of research and development, state of Missouri effective Dec. 1. He is leaving to accept a new post at Detroit, Detroit metropolitan area.

Russell H. Sorenson, executive vice president, National Aerospace Association, will resign that office and Feb. 1 to return to private industry. Arthur J. Sommer, NAA president, is expected to resign on that same date, although his term of office continues to June, 1948.

Profile Aerospace Corp. has signed a contract with Santa Fe Railway, Inc. for the service and maintenance of all skyway equipment, including overhead of P&W R-1830 and R-2800 engines, accessories, propellers and instruments.

U. S. Airlines, St. Petersburg, Fla., is negotiating for the acquisition of outstanding stock in Wills Air Service, Teterboro, N. J. Both are members of the Independent Airfreight Association.

### FINANCIAL

National Airlines Corp. reported a net loss of \$474,000 from sale of securities for the first month ended with September, against a net profit of \$821,651 for monthly period a year ago. Ordinary income for current period was \$100,000 compared with \$100,205 last year.

Republic Aircraft Corp., an association of voluntary aircraft manufacturers, has a net loss of \$112,073 for period July 1-Sept. 15, 1947. Application of net reduction in reserves of \$152,037 produced a net credit to surplus of \$126,179.

### FOREIGN

United States and Austria have signed an interim air transport agreement, based on the KCMO standard form, to facilitate and promote the mutual economic development of air transportation between the two countries. It is the first air transport agreement concluded by Austria since the war.

Yugoslavia has signed a new air transport agreement with Yugoslavia, including a daily round trip between Belgrade, Zagreb and Sarajevo.

## DEPENDABILITY ACCURACY ECONOMY



Since 1941, Whitehead has supplied American industry with stampings heretofor unavailable. Write for Catalog.



**WHITEHEAD  
STAMPING CO.**  
1911-1946

147 W. Lathrop, St. Paul  
MINNESOTA 55102



This type of suspension, consisting of high strength, high tensile strength, extremely light weight, and extremely high fatigue resistance, is the most advanced design yet.

We are able to supply ball bearings of all types in our standard quantities, or we shall be pleased to quote on special types or other types or in special sizes.

MAURICE AIRCRAFT, INC.  
BIRMINGHAM, ALA.



**INCREASE  
AIRPLANE REVENUE**

**INCREASE  
STUDENT TRAINING**

**INCREASE  
AIRPLANE RENTALS**

**INCREASE  
FLYING SAFETY**

with  
**FEDERAL  
ALL-METAL  
Skis**

Don't let snow close the airport you operate on. Equip your planes with skis and keep them flying. Make every winter flying trip a profit.

Thousands of skis are now being used on all types of aircraft. Enclosed are more details. When heavy snow falls stop all other means of transportation, you can get there with Federal All-Metal Skis.

Manufactured  
Since 1935



Every Field  
A Landing Field

**FEDERAL  
AIRCRAFT WORKS**  
MINNEAPOLIS 11, MINN. U. S. A.

See FEDERAL AIR CRAFT WORKS  
in the Yellow Pages of the St. Paul Phone Book,  
Ext. 242-A, Minneapolis, Minn.

## Everybody agrees COSTS MUST COME DOWN



One important place to start reducing costs is with the machine where goods are made.

Special production is very definitely a function of New Departure ball bearings.

Operating with less friction, less wear than other types, the ball bearing is "tailored" for the higher speeds, greater rigidity and improved quality of product demanded by today's existing production standards.

Thus, an investment in machines of precision ball bearing design is an investment in future production—lower cost.

New Departure's technical literature is helpful. Tell us your needs.



nothing rolls like a ball

## NEW DEPARTURE BALL BEARINGS

10% of machine tool builders con-  
tracting to change over to New Departure  
ball bearings.

# "If it isn't Wide Enough It isn't Good Enough"

...TO MEET  
TODAY'S PROBLEMS

GET 3 DESIGN BENEFITS WITH  
**NORMA-HOFFMANN**  
"CARTRIDGE" BEARING



CONVENTIONAL BEARING: Built-in locknut holds bearing in housing cavity.  
NORMA-HOFFMANN CARTRIDGE BEARING: Built-in locknut, cartridge housing, and bearing are assembled as a single unit.

Here's What  
You Get

**1. Longer Life** A 100% greater grease capacity than conventional width sealed bearings. This means longer grease life...longer periods between relubrication...because a large volume of grease does not oxidize or dry out as readily as a thin film of grease.

**2. Greater Contact Area** 43% to 85% greater contact area between shaft and bearing bore and between housing and bearing O.D., as compared to conventional width bearing. This eliminates need for locknuts and results in greater shaft strength as it is unnecessary to cut locknut threads. Slippage and peening are also prevented.

**3. Full Load Carrying Capacity** Unlike many other sealed bearings, full size balls are used; hence, there is no reduction in load carrying capacity.

AMERICA'S  
No. 1 SEALED BEARING  
by  
**NORMA-HOFFMANN**

NORMA-HOFFMANN BEARING CORPORATION,  
STAMFORD, CONNECTICUT  
Sales Offices: New York, Boston, Montreal,  
Montreal, Cincinnati, Los Angeles, Portland, Seattle,  
Phoenix



JET ENGINE TEST CENTER: Aerial view of the National Advisory Committee for Aeronautics high altitude jet engine test facility at the Cleveland Municipal Airport. Largest wind tunnel tested in the altitude tunnel. Large building in the foreground is the engine research center where new materials, tools and instruments for jet engines are under development. (NACA Photo)

## Supersonic Compressor, New Ramjets Revealed at NACA Show

First inspection of Cleveland Flight Propulsion Research Laboratory unveils jet engine progress to 1,000 engineers and executives.

By ROBERT HOLTZ

Results of the first solid year of jet engine research at NACA's ramjet and rocket engine facility at the Flight Propulsion Research Laboratory on the edge of Cleveland Municipal Airport that was officially built to make possible a 4,000 rpm supersonic compressor, last-carrying aircraft with wings of from 2,000 to 4,000 miles at speeds of about 3,000 mph are now possible. Many lines of engine research include methods of basic research at supersonic speeds, improvements of existing aircraft, basic parts, recovery methods and the search for the most efficient means of bringing an aircraft up to the high speed (about 600 mph) required for metal compression in nozzle.

Practically no work is being done on supersonic engines in the very research laboratory on the edge of Cleveland Municipal Airport that was officially built to make possible a 4,000 rpm supersonic compressor.

Participating in the inspection were 1,000 aviation executives, engineers and research workers who flew in from all over the country. Dr. Hugh L. Dryden, new NACA research director, arriving in his new role for the first time.

► **Supersonic.** Last year the NACA staff, including the static jet and rocket engines are still at a relatively crude state, basic research has progressed considerably further than is generally realized. As a result, substantial gains in the power, durability, and producibility of supersonic turbines, ramjets and rocket

engines from the immediate future. Practically no work is being done on supersonic engines in the very research laboratory on the edge of Cleveland Municipal Airport that was officially built to make possible a 4,000 rpm supersonic compressor.

The 4,000 rpm engine required test facilities to produce 20 lb. of air per second. Jet engines now can test at Cleveland at speeds up to 80 lb. of air per second and jets now on the drawing board will require up to 400 lb. per second. As a result an exhaust air extraction program is underway to provide new tools for the high altitude and supersonic testing required by the new well-defined trend in jet and rocket programs.

In addition to two supersonic tunnels already operating, two new ones are under construction, one of which will

match mach number 5. The other will be many times higher than any supersonic tunnel now undergoing construction.

► **Supersonic Compressor.** Probably the most fascinating development exhibited at Cleveland was the NACA developed supersonic axial flow compressor that has been successfully operated in liquid air and free air at supersonic speeds. This development permits a single stage compressor to do the work that formerly required multi-stage compressor. According to Dr. Dryden, the supersonic compressor promises drastic reductions in size, weight and complexity of construction at a cost, at least initially, of some loss in efficiency. The laboratory is also working on ramjet flow compressor.

Among the other fields in which important research is under way are:

► **Ramjets.** Speeds up to 1,500 mph have been attained by 16-inch test model ramjets as drop tests off the Virgin Gorge. Five different designs are now under test. Basic research completed to date indicates that supersonic, last-carrying aircraft with wings of from 2,000 to 4,000 miles at speeds of about 3,000 mph are now possible. Many lines of engine research include methods of basic research at supersonic speeds, improvements of existing aircraft, basic parts, recovery methods and the search for the most efficient means of bringing an aircraft up to the high speed (about 600 mph) required for metal compression in nozzle.

► **Free-Flight.** Calculations are that an air-filled envelope will replace current aircraft at half the cost and about 10 times the range.

► **Materials.** Development of a new type of material called Goretex—a fabric of monofilament and satellite fibers—allows a gas turbine to withstand temperatures up to 1,500° F. Other developments include casting of metallic alloys with ceramics and considerable progress in working ceramic materials into the intricate shapes required in jet engines.

► **Thrust Augmentation.** Three methods of thrust augmentation have reached an advanced stage of development—after

burning in the tail pipe, water-cooled injection and air bleed-off with secondary combustion and jet Afterburning appears to be the most economical, affording a 15 percent increase in thrust with a fuel flow of 30 gal. an hour. Water-cooled injection offers a 25 percent increase with 60 gal. per hour additional fuel. An bleed-off has given the best results—an 85 percent increase in efficiency requiring 150 gal. more fuel per hour. Using air bleed-off it is possible to get 7,000 ft more thrust for short periods, faces a serious threat that 600 ft per engine.

**Design.**—The problem of maintaining the critical stability wing problem in jet engines are being studied an air separator that keeps the heavier super-cooled mountain air out of the air flow to the compressor and bleed-off of hot exhaust gas to heat the air intake.

**Diffusion.**—Experiments are under way with three types of diffusers for transonic and supersonic intake to minimize shock wave effects on the air flow. Spike diffuser intakes to keep the shock waves well in advance of the air intake flow while perforated and convergent-divergent diffusers are designed to keep the shock waves out of the intake flow to the compressor in transonic and supersonic air tunnels.

Among other problems under investigation are high altitude flow out, lubrication, fuel distribution control and wear control for rocket engines.

## Congressional Group Splits for Studies

The Congressional Air Policy Committee and its 15-member industry Advisory Board, now separated from the U.S. Senate Foreign Affairs, evidenced little likelihood of action before the re-opening of Congress in January, although the group's chairman, Sen. Owen Brewster (R., Me.), has announced the resuming of membership to Washington Oct. 26.

After inspection tours of the carrier Midwest at Norfolk, Monell Field at Montgomery, Ala., and Eglin Field, Fla., under Brewster's plan, the four subcommittees that have been appointed would immediately set to work in their specialized fields. It appears unlikely, however, that a sufficient number of committee members and advisors will return to Washington for group hearings.

Key subcommittees on combat aircraft, designed to draw up the revised defense aviation program which may largely determine the future of aviation as well as military aviation, is headed by Rep. Carl Hinckley (R., Calif.). In addition to its primary objective of streamlining combat plane procurement, the subcommittee will



EXPERIMENTAL RAMJET: Flight testing of an experimental ramjet aircraft at the National Advisory Committee for Aeronautics Cleveland flight propulsive laboratory. Other NACA crafts have attained a speed of 1,300 mph in the flight.

climb into military policies on research, airports, safety installations, and training.

Other members are Sen. Homer Cappon (R., Ind.), Sen. Ernest McFarland (D., Ariz.), and Rep. Paul McCloskey (D., Tex.). Advisory members are Maj. Gen. Hugh J. Keay, Adm. John Town, J. H. Knobbeberger, and Captain Ward.

Other subcommittees

**Manufacturing.**—Headed by Sen. Albert Hawley (R., N. J.), a former U.S. Senator and Civil Service Commissioner, this subcommittee will deal with industrial production, presentation policies, research and development, finance, and expects to frame legislative legislation in these fields. Hinckley, Adm. Charles Walston (R., N. J.), Sen. Ed Johnson (D., Colo.), and Rep. Alfred Bartalek (D., N. J.) are members, and advisors are Robert Draper, Robert Gray, J. H. Kindelberger, M. H. Herren, Carlton Ward, Joseph Kenna (AFRA), Victor Enstrom, Charles Sonnen, Gen. Elton Wilson, Adm. Town, and Gen. John Wilson.

**Transportation.**—This subcommittee, with a goal of comprehensive legislation, covering the 1948 CAB Act, is headed by Sen. Owen Brewster.

(R., Me.) Although the controversial chosen instrument issue will be avoided, the subcommittee plans to investigate all other problems of military as well as civilian transport. Members are Hinckley, Cappon, Rep. Ed Stefan (R., N.J.), Johnson, and Kenna. Ralph Davies, Earl Slick, Col. Romeo Turner, P. M. Litchfield (representing lighter-than-air), Joseph Keay, and Capt. Rob Wilson are as advisors.

**Governmental Organization.**—In addition to the physical organization of government agencies, this subcommittee, headed by Sen. Cappon, plans to move functions, with particular emphasis on the slowing of regulatory procedures. Hawley, Walston, Kenna, and Enstrom are members, and Capt. Rob Wilson, Earl Slick, and Ralph Davies, advisors.

Longfellow Morris, committee executive secretary, expects to organize a staff of eight administrative assistants, plus liaison members in the Air Force, Naval Aviation, CAA, CAB, and Commerce Department, and Air Policy Committee.

## NAA Awards

Eight life memberships in the National Aerospace Association will be presented at a dinner meeting celebrating the Association's 25th anniversary, Oct. 22, at the Washington, D. C. Statler Hotel. Life certificate recipients are C. E. Morris, pioneer aviator and aeronautical engineer; Jacques Cadrart, aviator speed flyer and head of the World War II Warplane program; Dr. George W. Lewis, aircraft former research director of NACA's Langley Works; Kuhn, of Cincinnati Aircraft Engineering Corp.; NAA judge and timer at many air shows and meets; Francis Tinker, Milwaukee, businessman; Mrs. Anna Davis, Cleveland, woman pilot and chairman of the Wing Soaring National Advisory Committee; John D. Adams, Del Monte Chairman of Commerce secretary, Armon Carter, Ft. Worth publisher.

## Young Resigns

The White House last week announced the resignation of CAB member Clarence M. Young, who took office in February, 1948, to fill out the unexpired term of Dr. Edward F. Wixson. Young's resignation was submitted on Aug. 18, but he stayed in office until that month at the President's request. The Republican board member said this year was appointed to a full three-year term which extended until Dec. 31, 1952. He was expected to take an expert position on the West Coast.



Members of the President's Air Policy Commission, testing the nation's aircraft manufacturing plants, are shown to watch a propeller aircraft parts during their visit to Beech Aircraft Corp. at Wichita. Left to right: John F. Gaty, vice president and general manager of Beech; Adm. Elton Slick, chairman of the commission; John G. Tamm, director of the Bureau of Aircraft Manufacturing; Adm. Thomas E. Watson, Commission chairman; Chairman John McCloskey; Vice Chairman George Balles, and Commissioner Palmer Hoyt, who joined the party at Wichita.

## Two Air Policy Groups Planning New Legislative Programs

Similar findings by President's and Congressional committees may result from uniform testimony.

Prediction that the two fact-finding bodies now examining the aviation problem are likely to arrive at nearly the same conclusions as to remedial actions necessary is being made by Washington observers, despite the fact that two opposite political groups control the fact-finding.

The forecast is based partly on the fact that many of the witnesses before President Truman's Air Policy Commission are also testifying as controllers to the joint Congressional Air Policy Committee. The Congressional group has already the broadest brief, but the President's Commission and eventually will have its own representation as a further guide. It is difficult to conceive of the Congressional committee finding even if it looked for responsible evidence contradicting the favorable views of industry testimony which has been called up in recent weeks before the Commission, supplemented by secret sessions with top military leaders.

Reports that the President's Air Policy Commission had wired for a

degree of all secret and pending legislation were interpreted as some legislation at least that the Commission might propose more definite legislation is its responsibility as its recommendations to President Truman, perhaps for him to forward as a message to Congress.

Aviation legislation growing out of the two fact-finding bodies studies is not expected to start its way through the legislative hopper until the Congressional committee makes its report in March. Congressmen say aviation legislation introduced before that time will be held inactive under the Committee's report. Since the joint Committee is still composed of the House and Senate members which are committees action on aviation legislation, it is likely that any legislation which the joint committee agrees to recommend will then have advanced itself willingly.

There is speculation that the joint committee may report out of committee with legislation embodying the changes it wishes to recommend simultaneously with its report, which would step up the whole legislative timetable entirely.

**Witnesses Listed.**—In addition to Gen. Echols' testimony last week, the President's Air Policy Commission's branch Robert Clegg, Lockheed Aircraft Corp. president; J. Charles Ward, Jr., Franklin Engine & Airplane Corp. president; Capt. C. H. McLaughlin, chairman, U. S. Flying Ships, Inc.; F. R. Bennett, president, Spanish Gypsum Co., Inc.; Nathan C. Shultz, president, Midwesters Corp.; T. N. Panchi, president, Pascali Helicopters Corp., and Richard B. Clossing, Allianz division, General Motors Corp.

## Mid-Atlantic Ditching Starts CAA Investigation

CAA started an investigation last week into the emergency landing Oct. 24 of an American International Airways Boeing 314A flying boat in the Atlantic Ocean 840 miles northeast of Newfoundland on a Shannon-Newfoundland flight.

The plane carried 62 passengers and seven crew members, according to first reports. Charles Morris, the pilot, radioed he had set it down without injury to himself or his crew. A Coast Guard search ship and strong headwinds delayed his return to the scene.

The New York company has been operating under a letter of registration CAA-81, but had no CAA certificate for commercial carrier operation under section 42 of the Civil Air Regulations. CAA sought to learn whether the flight was made on a strictly contract basis or route were sold through a public ticket agency, as well as the exact circumstances of the forced landing.

HEADLINE NEWS



TOP VIEW OF NEW SWEPTWING FIGHTER

Top view of the Air Force's first sweptwing fighter, the XP-56, which is expected to attain speeds up to about 650 mph. (AVIATION WEEK, Oct. 6) under standard conditions. The craft, built by North American, is emerging ground and test flies preparatory to its first takeoff flight by North American test pilot George Welch. (IN Photo)

## Northrop Shows Profit Of \$240,573 For Year

From a net profit of \$240,573 for the fiscal year ended July 31, Northrop Aircraft, Inc., stockholders, as record Oct. 9, will receive a dividend of 25 cents a share.

Stockholders were mailed annual reports at the end of last week, and were told that their company closed the fiscal year with \$7,321,323 in current assets, no outstanding bank loans and a minority ledger balance amounting to \$23,905,000. Working capital stood at \$3,397,000, a \$712,000 improvement over the previous year's working capital position.

Of unusual interest in Northrop's annual report is the admission that this company, as have other aircraft builders, may now be entering into a new field of endeavor. Ross Alexander's wife of this stockholders' local radio business was a street cleaner example of an overall stockholders' disaffection at a non-aircraft project. Northrop now cites the dissolution, during the year, of its non-aircraft business subsidiary, Northrop Foundry, Inc., and the intention of bankruptcy proceedings by its wholly-owned subsidiary organization, Salsbury Mfg. Co.

Present strength of the company lies in its massive Flying Wing production and development projects, development of the power-turbine transport, Northrop V-1790 Transport, now having a staff of 120 persons, and recent military contracts for the development of research and guided missile development. The company has been ratified by Air Materiel Command that a reduced engine development budget will hold AMC-specified studies of Northrop's "turboliner" jet engine after May 1945.

### New Wind Tunnel Will Study Jet Engine Fires

A new wind tunnel designed to study fires started in jet engines is now nearing completion at Waco, Calif. Vicksburg Airport, Indianapolis Ind. Jet aircraft engines, modified in typical flight and combat modes, are mounted in the tunnel and set afire in simulated flight conditions provided by a 3,000 hp blower. The action of various fire detection, which were pilot of the fire, lighting lights on the instrument panel, and the extinguisher methods will be studied. The tunnel is being built by the Air Force, Navy and the Allison Division, General Motors Corp. It will be conducted by the present brand of aircraft engineers, the Boeing Co. 12th Air Force, and ground flight safety 12th A. F. Klein Design, con-

tractors, and widely varying individual

AVIATION WEEK, October 20, 1947

## International Air Show Scheduled for July '48

A nine day International Aviation Exposition is to be held sometime during July 1948 at New York's Idlewild Airport will feature displays from the U. S., United Kingdom, France, Canada, the Netherlands, Scandinavia, countries and some Latin American nations.

High point of the exposition will be the dedication of Idlewild as the city's international airport. Other events will include flights by U. S. and foreign aircraft, a new type biplane, biplane demonstrations of new motorized biplanes and road parades by a parade of American transport executives and personal planes (past and present).

A part of New York's 1948 golden jubilee, the air show will be administered by \$100,000 by the New York Port Authority which will place the facilities of Idlewild at the disposal of the exposition.

## AVIATION CALENDAR

Oct. 26 International Air Transport Association meeting, New York City. Oct. 26-28 All Industries and Transport Association of Canada annual meeting, Galt, Ontario, Canada.

Oct. 28-30 "Our Day in Texas" aviation show, Dallas, Texas.

Oct. 29-30 National conference of Small International Airport in America, Kansas City, Mo.

Oct. 30-31 Meeting of the Board of State Aviation Officers, Pittsford, N. Y.

Nov. 1-2 Flying Club International, Atlanta, Ga.

Nov. 5-6 All Japan conference on insect control, Nagoya, Japan.

Nov. 10-12 National Conference of Automobile Manufacturers, Chicago.

Nov. 11-12 Small and Lightweight aircraft, St. Louis, Mo.

Nov. 20-21 National Aviation Trade Show, New York City.

Nov. 21-22 Flying Club International, Atlanta, Ga.

Nov. 22-23 Meeting of the Board of State Aviation Officers, Atlanta, Ga.

Nov. 24-25 All American Airlines, Atlanta, Ga.

Nov. 25-26 All American Airlines, Atlanta, Ga.

Nov. 26-27 All American Airlines, Atlanta, Ga.

Nov. 27-28 All American Airlines, Atlanta, Ga.

Nov. 29-30 All American Airlines, Atlanta, Ga.

Nov. 30-31 All American Airlines, Atlanta, Ga.

Dec. 1-2 All American Airlines, Atlanta, Ga.

Dec. 3-4 All American Airlines, Atlanta, Ga.

Dec. 5-6 All American Airlines, Atlanta, Ga.

Dec. 6-7 All American Airlines, Atlanta, Ga.

Dec. 7-8 All American Airlines, Atlanta, Ga.

Dec. 8-9 All American Airlines, Atlanta, Ga.

Dec. 9-10 All American Airlines, Atlanta, Ga.

Dec. 10-11 All American Airlines, Atlanta, Ga.

Dec. 11-12 All American Airlines, Atlanta, Ga.

Dec. 12-13 All American Airlines, Atlanta, Ga.

Dec. 13-14 All American Airlines, Atlanta, Ga.

Dec. 14-15 All American Airlines, Atlanta, Ga.

Dec. 15-16 All American Airlines, Atlanta, Ga.

Dec. 16-17 All American Airlines, Atlanta, Ga.

Dec. 17-18 All American Airlines, Atlanta, Ga.

Dec. 18-19 All American Airlines, Atlanta, Ga.

Dec. 19-20 All American Airlines, Atlanta, Ga.

Dec. 20-21 All American Airlines, Atlanta, Ga.

Dec. 21-22 All American Airlines, Atlanta, Ga.

Dec. 22-23 All American Airlines, Atlanta, Ga.

Dec. 23-24 All American Airlines, Atlanta, Ga.

Dec. 24-25 All American Airlines, Atlanta, Ga.

Dec. 25-26 All American Airlines, Atlanta, Ga.

Dec. 26-27 All American Airlines, Atlanta, Ga.

Dec. 27-28 All American Airlines, Atlanta, Ga.

Dec. 28-29 All American Airlines, Atlanta, Ga.

Dec. 29-30 All American Airlines, Atlanta, Ga.

Dec. 30-31 All American Airlines, Atlanta, Ga.

Dec. 31-1 All American Airlines, Atlanta, Ga.

Jan. 1-2 All American Airlines, Atlanta, Ga.

Jan. 2-3 All American Airlines, Atlanta, Ga.

Jan. 3-4 All American Airlines, Atlanta, Ga.

Jan. 4-5 All American Airlines, Atlanta, Ga.

Jan. 5-6 All American Airlines, Atlanta, Ga.

Jan. 6-7 All American Airlines, Atlanta, Ga.

Jan. 7-8 All American Airlines, Atlanta, Ga.

Jan. 8-9 All American Airlines, Atlanta, Ga.

Jan. 9-10 All American Airlines, Atlanta, Ga.

Jan. 10-11 All American Airlines, Atlanta, Ga.

Jan. 11-12 All American Airlines, Atlanta, Ga.

Jan. 12-13 All American Airlines, Atlanta, Ga.

Jan. 13-14 All American Airlines, Atlanta, Ga.

Jan. 14-15 All American Airlines, Atlanta, Ga.

Jan. 15-16 All American Airlines, Atlanta, Ga.

Jan. 16-17 All American Airlines, Atlanta, Ga.

Jan. 17-18 All American Airlines, Atlanta, Ga.

Jan. 18-19 All American Airlines, Atlanta, Ga.

Jan. 19-20 All American Airlines, Atlanta, Ga.

Jan. 20-21 All American Airlines, Atlanta, Ga.

Jan. 21-22 All American Airlines, Atlanta, Ga.

Jan. 22-23 All American Airlines, Atlanta, Ga.

Jan. 23-24 All American Airlines, Atlanta, Ga.

Jan. 24-25 All American Airlines, Atlanta, Ga.

Jan. 25-26 All American Airlines, Atlanta, Ga.

Jan. 26-27 All American Airlines, Atlanta, Ga.

Jan. 27-28 All American Airlines, Atlanta, Ga.

Jan. 28-29 All American Airlines, Atlanta, Ga.

Jan. 29-30 All American Airlines, Atlanta, Ga.

Jan. 30-31 All American Airlines, Atlanta, Ga.

Jan. 31-1 All American Airlines, Atlanta, Ga.

Feb. 1-2 All American Airlines, Atlanta, Ga.

Feb. 2-3 All American Airlines, Atlanta, Ga.

Feb. 3-4 All American Airlines, Atlanta, Ga.

Feb. 4-5 All American Airlines, Atlanta, Ga.

Feb. 5-6 All American Airlines, Atlanta, Ga.

Feb. 6-7 All American Airlines, Atlanta, Ga.

Feb. 7-8 All American Airlines, Atlanta, Ga.

Feb. 8-9 All American Airlines, Atlanta, Ga.

Feb. 9-10 All American Airlines, Atlanta, Ga.

Feb. 10-11 All American Airlines, Atlanta, Ga.

Feb. 11-12 All American Airlines, Atlanta, Ga.

Feb. 12-13 All American Airlines, Atlanta, Ga.

Feb. 13-14 All American Airlines, Atlanta, Ga.

Feb. 14-15 All American Airlines, Atlanta, Ga.

Feb. 15-16 All American Airlines, Atlanta, Ga.

Feb. 16-17 All American Airlines, Atlanta, Ga.

Feb. 17-18 All American Airlines, Atlanta, Ga.

Feb. 18-19 All American Airlines, Atlanta, Ga.

Feb. 19-20 All American Airlines, Atlanta, Ga.

Feb. 20-21 All American Airlines, Atlanta, Ga.

Feb. 21-22 All American Airlines, Atlanta, Ga.

Feb. 22-23 All American Airlines, Atlanta, Ga.

Feb. 23-24 All American Airlines, Atlanta, Ga.

Feb. 24-25 All American Airlines, Atlanta, Ga.

Feb. 25-26 All American Airlines, Atlanta, Ga.

Feb. 26-27 All American Airlines, Atlanta, Ga.

Feb. 27-28 All American Airlines, Atlanta, Ga.

Feb. 28-29 All American Airlines, Atlanta, Ga.

Feb. 29-30 All American Airlines, Atlanta, Ga.

Mar. 1-2 All American Airlines, Atlanta, Ga.

Mar. 2-3 All American Airlines, Atlanta, Ga.

Mar. 3-4 All American Airlines, Atlanta, Ga.

Mar. 4-5 All American Airlines, Atlanta, Ga.

Mar. 5-6 All American Airlines, Atlanta, Ga.

Mar. 6-7 All American Airlines, Atlanta, Ga.

Mar. 7-8 All American Airlines, Atlanta, Ga.

Mar. 8-9 All American Airlines, Atlanta, Ga.

Mar. 9-10 All American Airlines, Atlanta, Ga.

Mar. 10-11 All American Airlines, Atlanta, Ga.

Mar. 11-12 All American Airlines, Atlanta, Ga.

Mar. 12-13 All American Airlines, Atlanta, Ga.

Mar. 13-14 All American Airlines, Atlanta, Ga.

Mar. 14-15 All American Airlines, Atlanta, Ga.

Mar. 15-16 All American Airlines, Atlanta, Ga.

Mar. 16-17 All American Airlines, Atlanta, Ga.

Mar. 17-18 All American Airlines, Atlanta, Ga.

Mar. 18-19 All American Airlines, Atlanta, Ga.

Mar. 19-20 All American Airlines, Atlanta, Ga.

Mar. 20-21 All American Airlines, Atlanta, Ga.

Mar. 21-22 All American Airlines, Atlanta, Ga.

Mar. 22-23 All American Airlines, Atlanta, Ga.

Mar. 23-24 All American Airlines, Atlanta, Ga.

Mar. 24-25 All American Airlines, Atlanta, Ga.

Mar. 25-26 All American Airlines, Atlanta, Ga.

Mar. 26-27 All American Airlines, Atlanta, Ga.

Mar. 27-28 All American Airlines, Atlanta, Ga.

Mar. 28-29 All American Airlines, Atlanta, Ga.

Mar. 29-30 All American Airlines, Atlanta, Ga.

Mar. 30-31 All American Airlines, Atlanta, Ga.

Mar. 31-1 All American Airlines, Atlanta, Ga.

Apr. 1-2 All American Airlines, Atlanta, Ga.

Apr. 2-3 All American Airlines, Atlanta, Ga.

Apr. 3-4 All American Airlines, Atlanta, Ga.

Apr. 4-5 All American Airlines, Atlanta, Ga.

Apr. 5-6 All American Airlines, Atlanta, Ga.

Apr. 6-7 All American Airlines, Atlanta, Ga.

Apr. 7-8 All American Airlines, Atlanta, Ga.

Apr. 8-9 All American Airlines, Atlanta, Ga.

Apr. 9-10 All American Airlines, Atlanta, Ga.

Apr. 10-11 All American Airlines, Atlanta, Ga.

Apr. 11-12 All American Airlines, Atlanta, Ga.

Apr. 12-13 All American Airlines, Atlanta, Ga.

Apr. 13-14 All American Airlines, Atlanta, Ga.

Apr. 14-15 All American Airlines, Atlanta, Ga.

Apr. 15-16 All American Airlines, Atlanta, Ga.

Apr. 16-17 All American Airlines, Atlanta, Ga.

Apr. 17-18 All American Airlines, Atlanta, Ga.

Apr. 18-19 All American Airlines, Atlanta, Ga.

Apr. 19-20 All American Airlines, Atlanta, Ga.

Apr. 20-21 All American Airlines, Atlanta, Ga.

Apr. 21-22 All American Airlines, Atlanta, Ga.

Apr. 22-23 All American Airlines, Atlanta, Ga.

Apr. 23-24 All American Airlines, Atlanta, Ga.

Apr. 24-25 All American Airlines, Atlanta, Ga.

Apr. 25-26 All American Airlines, Atlanta, Ga.

Apr. 26-27 All American Airlines, Atlanta, Ga.

Apr. 27-28 All American Airlines, Atlanta, Ga.

Apr. 28-29 All American Airlines, Atlanta, Ga.

Apr. 29-30 All American Airlines, Atlanta, Ga.

May 1-2 All American Airlines, Atlanta, Ga.

May 2-3 All American Airlines, Atlanta, Ga.

May 3-4 All American Airlines, Atlanta, Ga.

May 4-5 All American Airlines, Atlanta, Ga.

May 5-6 All American Airlines, Atlanta, Ga.

May 6-7 All American Airlines, Atlanta, Ga.

May 7-8 All American Airlines, Atlanta, Ga.

May 8-9 All American Airlines, Atlanta, Ga.

May 9-10 All American Airlines, Atlanta, Ga.

May 10-11 All American Airlines, Atlanta, Ga.

May 11-12 All American Airlines, Atlanta, Ga.

May 12-13 All American Airlines, Atlanta, Ga.

May 13-14 All American Airlines, Atlanta, Ga.

May 14-15 All American Airlines, Atlanta, Ga.

May 15-16 All American Airlines, Atlanta, Ga.

May 16-17 All American Airlines, Atlanta, Ga.

May 17-18 All American Airlines, Atlanta, Ga.

May 18-19 All American Airlines, Atlanta, Ga.

May 19-20 All American Airlines, Atlanta, Ga.

May 20-21 All American Airlines, Atlanta, Ga.

May 21-22 All American Airlines, Atlanta, Ga.

May 22-23 All American Airlines, Atlanta, Ga.

May 23-24 All American Airlines, Atlanta, Ga.

May 24-25 All American Airlines, Atlanta, Ga.

May 25-26 All American Airlines, Atlanta, Ga.

May 26-27 All American Airlines, Atlanta, Ga.

May 27-28 All American Airlines, Atlanta, Ga.

May 28-29 All American Airlines, Atlanta, Ga.

May 29-30 All American Airlines, Atlanta, Ga.

May 30-31 All American Airlines, Atlanta, Ga.

June 1-2 All American Airlines, Atlanta, Ga.

June 2-3 All American Airlines, Atlanta, Ga.

June 3-4 All American Airlines, Atlanta, Ga.

June 4-5 All American Airlines, Atlanta, Ga.

June 5-6 All American Airlines, Atlanta, Ga.

June 6-7 All American Airlines, Atlanta, Ga.

June 7-8 All American Airlines, Atlanta, Ga.

June 8-9 All American Airlines, Atlanta, Ga.

June 9-10 All American Airlines, Atlanta, Ga.

June 10-11 All American Airlines, Atlanta, Ga.

June 11-12 All American Airlines, Atlanta, Ga.

June 12-13 All American Airlines, Atlanta, Ga.

June 13-14 All American Airlines, Atlanta, Ga.

June 14-15 All American Airlines, Atlanta, Ga.

June 15-16 All American Airlines, Atlanta, Ga.

June 16-17 All American Airlines, Atlanta, Ga.

June 17-18 All American Airlines, Atlanta, Ga.

June 18-19 All American Airlines, Atlanta, Ga.

June 19-20 All American Airlines, Atlanta, Ga.

June 20-21 All American Airlines, Atlanta, Ga.

June 21-22 All American Airlines, Atlanta, Ga.

June 22-23 All American Airlines, Atlanta, Ga.

June 23-24 All American Airlines, Atlanta, Ga.

June 24-25 All American Airlines, Atlanta, Ga.

June 25-26 All American Airlines, Atlanta, Ga.

&lt;



## IATA To Standardize Traffic Practices

Action possible as result of traffic conferences in Brazil.

**PETROPOLIS**, Brazil—Standardization of many traffic practices will result from the meetings of the International Air Transport Association's traffic committee here held last week.

G. R. McGregor, general traffic manager of Trans-Caribbean Air Lines and chairman of the past meeting of the traffic committee, summarized the decision of the first of the two weeks of sessions, said.

"The resolutions establish a single body of language and practice in international air traffic matters throughout the world. It is the first time this has ever been done for any form of transport, and its importance cannot be overestimated."

Among the measures on which the traffic representatives of IATA's 63 members agreed:

- Standard tickets for passengers and crews, including simplified baggage checks, replacing existing forms.
- A universal air waybill and assignment note to succeed a variety of air waybills now in use, the completion of which, according to McGregor, has caused much loss of time and cargo.

The clubs themselves have tried to get American craft. For instance, Abe Lazarus, Secretary-General of the Federation of American Airlines, which operates 11 of the clubs, fought with the French government to buy 450 Paper Cycles or U. S. Army surplus in Germany.

The lot could have been had for about \$5000 apiece, but the government was not willing to make available the foreign exchange and the clubs went instead to Sweden, Canada and Switzerland. Similarly, the North African semi-clubs are negotiating for dollar exchange needed to buy 54 surplus Fairchild Packets, said Tom Atkins. But with France's current dollar crisis, they have little chance of success.

In contrast to the undoubted growth of private flying in the U. S., semi-clubs have a long history in France, where personal flying has been privately regarded as a sport. In 1979 there was about the same number of clubs as at present. Semi-clubs are now marketable documents.

### Paris Letter:

## French Private Flying Clubs

You almost use these months water when French private flyers talk about the Paper Club and other single seat American small planes. Yet they have bought only a few of these, and altogether there are only 200 or 300 privately-owned small craft in France.

Considerably more Frenchmen and North Africans could afford to own a plane, and could even manage to wring dollars to buy an American one. But they hesitate—fear of taxes. The average semi-club Frenchman makes his income and property to the tax authorities, and he is taxed.

The government consistently and

unjustly signs off on the incomes of those of us who are individualists. And a personal plane in France is a glaring sign of high income. It is much safer to fly a twin-engine plane owned in common with friends in an aero-club.

Actually most private flying is organized into these aero-clubs, of which about 450 exist in France and French North Africa.

The clubs themselves have tried to get American craft. For instance, Abe Lazarus, Secretary-General of the Federation of American Airlines, which operates 11 of the clubs, fought with the French government to buy 450 Paper Cycles or U. S. Army surplus in Germany. The lot could have been had for about \$5000 apiece, but the government was not willing to make available the foreign exchange and the clubs went instead to Sweden, Canada and Switzerland. Similarly, the North African semi-clubs are negotiating for dollar exchange needed to buy 54 surplus Fairchild Packets, said Tom Atkins. But with France's current dollar crisis, they have little chance of success.

In contrast to the undoubted growth of private flying in the U. S., semi-clubs have a long history in France, where personal flying has been privately regarded as a sport. In 1979 there was about the same number of clubs as at present. Semi-clubs are now marketable documents.

In contrast to the undoubted growth of private flying in the U. S., semi-clubs have a long history in France, where personal flying has been privately regarded as a sport. In 1979 there was about the same number of clubs as at present. Semi-clubs are now marketable documents.

## FINANCIAL

### Airlines May Seek More Funds By Means of Public Financing

Further offerings likely with improvements in general credit; Western receives RFC loan; Atlas may underwrite Northeast issue; others needing capital.

With any sustained improvement in current earnings, the airlines may attempt further public financing at the existing opportunity. The need for additional credit has long been evident but recent circumstances have mitigated any large-scale public underwriting.

Western Airlines may repeat its earlier success in an attempt to raise \$10 million in capital financing. The company has just received a \$4,500,000 loan from the Reconstruction Finance Corp. Changed circumstances make this possible. Previously, the RFC advised that it would grant this advance if the Civil Aeronautics Board would approve the sale of Western's AM 65 in United for \$3,750,000. The CAB refused to pre-empt the car and only after its decision was made, was the RFC loan to continue the previous pre-empted stage necessary to make this loan.

The significant measure that with Western's increasing previous losses contributed to this more favorable outcome is the recent decision to merge with Pan American. This was never publicly available. Similar circumstances can prevail for almost any other airline now in need of additional capital.

• **Not Easy Money**—The RFC loan to Western reflects an "easy money" policy as the part of the strategy toward the airlines. The loans are for a three year period and carries a 4 percent interest rate. Amortization payments are provided at the rate of \$125,000 monthly for the first six months, \$75,000 each for the second six months and the balance payable at maturity. Further, this loan is secured by the various assets of Western and it probably will remain so for the duration of the loan.

The equipment is, in fact, an all-in loan to the club, so on the basis that they will employ 20% of its flying time to the best interests of young people. The government will be responsible for the complete overhead of the planes at the factory, after 200 hours. Immediately the overheads are borne by the clubs.

Trade sources report that Northwest Airlines may soon market a convertible preferred stock issue to about \$2 mil-

lion or more. It is presumed that the Atlas Corp., which presently owns 26 percent of Northwest's common stock, will underwrite the new issue. In this instance, it is believed, Northwest will have sufficient funds to repay total loans and dividends made by Atlas Corp. to about \$10 million.

In effect, Atlas may be making one type of security for another. Finally, the exchange will give Atlas a more attractive type of security which it may sell more readily to any interested buyer. In view of the Atlas Corp.'s interest in the Continental Airlines, it may only be a question of time before it is required to dispose of the Northwest investment.

► **Funds Needed**—A number of other carriers, particularly the smaller and regional lines, are in desperate need of additional funds. But no public financing can be undertaken unless there is a basic improvement in general airline credit. A number of arrangements are possible for higher preferred loans and a variety of revenue measures and collateral structures. Accompanying this date, but later passed with greater intensity, is the almost universal industry-wide request for higher capital compensation. That is, American and Northwest are the only carriers who have abstained from asking for more capital.

The need for additional capital will be particularly acute for many lines currently unable and to sustain a competitive position. For instance, the self-financed carriers are proceeding with more aggressive acquisition programs. On the other hand, competitive lines for the most part are continuing to grow. The DC-3 and DC-4s will be placed on an even more aggressive disadvantageous position. This will still have the continued operation of relatively high cost equipment and loss of traffic to the far more modern and larger planes in service on competitive lines.

Trade sources report that Northwest Airlines may soon market a convertible preferred stock issue to about \$2 mil-

lion dollars. This insatiable appetite for new capital leads to one conclusion to the small regional carriers. The major trunk lines who recently completed major pieces of financing are less likely to be the carriers concerned. United Air Lines, which is worth at February of this year \$1.6 billion, was reported as exploring the possibility of securing additional capital. However, this problem appears to have been indefinitely postponed with the termination of its contract with the Glenn L. Martin Co. for the purchase of about \$1.6 billion in aircraft.

United has a bank credit of \$18 million and is believed to have drawn down about half of this amount. The company's purchase of Western's AM 65 and assumption of the semi-club DC-6 contracts has been one factor in considering the original capital problem. Of greater importance, however, is the significant restructuring of United's financial structure. United Airlines recently reported that UAL's Chicago lease, originally estimated to require \$75,000,000, has drawn about \$7.5 million and is only about 70 percent completed. Monthly contributions each month have spent building programs in all directions and the airline's profitability has, in the group, is in great need of expanded facilities. This timely news to postpone wholly needed construction projects.

► **Other Lines**—American Airlines, which has had two years ago raised some \$80 million in new funds, may entertain additional financing proposals next year when it completes payment for the 100 Convair 880 to be delivered at that time.

Northwest Airlines has indicated that it does not propose to draw down any portion of its \$15 million bank line that year.

Of all the major carriers, Eastern is probably the only one which may safely add any public financing during the next 15 months or so. This company has a five year revolving bank credit in the amount of \$20 million which may adequately service its capital needs in the immediate period ahead.

It is a certainty that as a period of sustained earnings is attained by the various carriers, preparations will be made for various forms of financing. The RFC may be expected to become more active in this direction. However, many carriers believe that the RFC will not increase its involvement in public financing. Further, on all such credits granted, the CAB approval in various forms must be obtained, that is, for an involved and costliest procedure. In the final analysis, the best source of additional capital and with the greatest degree of flexibility will result through established financial channels.

—Selig Abachad

# WHILE WE DELAY—

## Russia Drives for the Atlantic

**I**N THE STRUGGLE to keep western Europe west of the Iron Curtain it is later than you think. Unless the United States quickly mobilizes its own and other nations' resources, World War II will be lost as World War I was lost—by no economic follow-through.

Millions of people in western Europe, living in cold homes or no homes at all, face another winter of near starvation. Some countries are absolutely without dollars to buy abroad the food and fuel they need for survival. Others slide toward that desperate state.

In that welter of military Russia grasps for dominion over all Europe. Everywhere, as cold and hunger deepen and as men begin to doubt America's determination to help, Russia turns on the pressure. In France the Communists drove to overthrow the Government. In Italy they do likewise. In Greece Russia kills the United Nations investigating commission. In Tunisia this follows us out of the way. In Germany and Austria the Soviet commanders alternately strangle and beat the Allied governments.

**FACED WITH** this bloodless attack, the leaders of western Europe and of the United States have not covered themselves with glory.

Look, for example, at what the sixteen European countries participating in the Paris meetings on the Marshall "plan" first proposed to the United States as a catalog of their needs. In the main it was simply an adding up—to \$38 billion—of what the various countries thought they needed to keep going in the same old way at the same old stands. There was no real start on plans for the mutual aid by European states which is the essence of a successful recovery program... no real start on plans to knock down the barriers which divide European trade into hopelessly inadequate little pockets... no real plan to clean up currencies which determine so fast whether wants to work for them. In fact no plan to make people work to work.

Meanwhile, what have our leaders offered? Not much more than one fine commencement speech by

General Marshall, outlining a good idea, and a couple of mouthfuls of statistics, with more to come.

Not even a beginning has been made on the most crucial part of any European aid program—that of explaining to the American people what these parts must be and why. It is true that not all the reports of all the statistical committees have been completed. They never will be. But it is also true that the broad outlines of what the United States must do to save Europe are already clear. And it is not simply to provide more dollars, although \$12 to \$16 billion more—the cost of 6 or 8 weeks fighting in World War II—may be required.

A far more basic requirement is leadership which will lift Europe out of the slough of despair and get recovery rolling. Without that leadership, more leniency for Europe will say in nothing but more leniency and remorse on both sides of the Atlantic.

**WHAT ARE** the ingredients of that leadership? Here are a few:

### 1. A bi-partisan program for European recovery.

It should be so thoroughly understood and so overwhelmingly supported by both parties that playing politics with it will be like selling military secrets to the enemy.

Truman and Vandenberg have failed miserably to develop and explain a complete program—one in which Europe and America can have full confidence. Nor have Taft and Dewey and other candidates for high office pledged that position will stop at our shoreline. These men must speak out. To date Herbert Hoover alone has had the courage and vision to start a program.

### 2. A mobilization of American food supplies.

We must assure people at home and abroad that our crops, cut down by drought and heat, will be stretched to cover minimum European needs (with whatever help we can muster from other nations) without forcing still higher food prices here.

Some food experts are comfortingly confident that the stretching can be done. But

wheatless and wheatless days, higher extraction of flour from wheat and similar voluntary conservation never would make it surer. And they would demonstrate that a free country can mobilize itself to meet a very serious crisis.

### 3. An understanding that relief is one problem and recovery another.

Both problems must be solved. Relief emergency must be met, sooner or later, at any cost. But they must not block out the longer task of recovery. Italy illustrates the point. Italy, particularly the south, is a flat breaker. Help is needed right now to keep people from dying in the streets. But we must eventually do more than keep the Italian people alive. We must help them get back to useful work so that they can stand on their own feet.

### 4. A steady insistence on results—which means that Europe must find a way to make its people want to work.

In the U.S.S.R., they have a way to get things done. It is to liquidate those who do not work. In the U.S.A. we have a way to get things done. It is to create incentives to make people want to work. Western Europe, notably France and Britain, has fallen between two stools. It has liquidated away the incentives, and it does not yet, think heaven, endave the laggards. We should make it crystal clear that we have no designs on the national "sovereignty" of others. But we should make it equally clear that we want that those countries which receive our aid work hard enough to get results. To this end continued aid should be on an intelligent plus, each installment conditional on getting results. Otherwise more billions can easily disappear down the drain.

### 5. Insistence on all-out self-aid by European countries.

That is the constructive core of the Marshall idea—to help Europe to help itself. In his brilliant "Report on Germany" and how to get it "off the backs of the American taxpayer," Lewis H. Lichten, John-Manville Chairman, shows how the export of only 10 million tons of coal a year from Britain to western Europe would speed industrial recovery of the Ruhr immeasurably. There are countless other cases where effort in one European country—or a group of countries

—will break a big industrial bottleneck in another. We should insist that everything possible be done to see they are broken.

### 6. An agreement with Britain and France giving us authority in western Germany equal to our responsibility.

Britain is shifting to us most of the financial burden she has been carrying in the German occupation. Less directly we shall also be carrying much of the French occupation load too. We must have authority in the economic field commensurate with our responsibilities. Otherwise the management of western Germany can poison Anglo-American and Anglo-French relations in addition to wasting resources we could use to promote general European recovery.

It is truly said in the scriptures that the Lord leaveth a cheerful giver. But it is not recorded anywhere that anyone, including the recipient, loves a soft-headed giver. Hence as a caption my program of aid for Europe should have豪气ency assuring that only what is needed is sent; that what is sent does the job for which it is sent; and that arrangements are made for the recipients to pay back whatever they can.

**THE AMERICAN PEOPLE** should be told clearly by their leaders that there is no assurance that the best possible program of economic aid for Europe will do the job. The time is very late.

In France and Italy, as our help falters, the Communists right now are percolating strikes which will make the people's suffering more acute. They hope, of course, to overthrow the governments in both these countries and to seize control. If Communist dictatorships are clamped on France and Italy that fall, Russia and her satellites will have advanced 500 miles west—toward us.

Americans should be clearly told, therefore, that not to undertake an immediate program for the recovery of Europe is to bring closer the greatest possible national disaster—World War III.



President, McGraw-Hill Publishing Company, Inc.

THIS IS THE 6TH OF A SERIES



JET SCHOOL

Army personnel from Wright Field viewing an explosion of the engine of a Douglas compressor test aircraft. Donald R. Phillips of the jet school severely injured by General Electric Co. in its aircraft gas turbine division, Lynn, Mass. To date more than 250 men from Army, Navy, CAA, NACA and aircraft companies have entered the school. It has delivered courses keyed to particular requirements of the students. (Wide World photo)

## Fairchild Reports Largest Peace Profit in Company History

Net income of \$862,047 bolstered by \$657,039 operating profit; C-82 sales are 84 percent of total.

While reporting for 1946 the largest postwar profit in its history (and one of the best in the country for the year), Fairchild Engine & Airplane Co. expects to complete by June 1947 the C-82 Paket contract which accounted for 84 percent of 1946 sales, the annual report disclosed.

Reported operating profits:

- By manufacturing \$103,000
- By producing \$196,875, of which \$4,815,094 represented cash, and \$5,106,175, net revenue.
- Compared to some other companies in the industry, this can be considered a very favorable inventory situation, much of it presumably is for the Paket.

### Convair is Pushing Transport Production

Consolidated Vultee's Convair has passed CAA stability tests, and is awaiting final certification of the Paket order it submitted as the company's backlog figure. About \$53,000,000 in Dec. 31, 1946, and approximately \$78,000,000 on Aug. 31. Of this amount, 76 percent is held for military production, with commercial production five percent, and military research and development, 17 percent.

► **Personnel**—**Paula Poblete**—Fairchild's personnel plane plant is in flight. Of

the 100 F-24s built by Texas Engineering and Manufacturing Co., Fairchild sold 173 in 1946, according to the report. The report states that "plans for production of the new F-47 'Self-seal' CAA certifiable and interim developments in the present aircraft industry." From other sources it is understood that the F-47 program has been delayed pending replacement of the original test plane which crashed, without injury to the pilot, during a trial flight, and until the failure of the F-24s are solved.

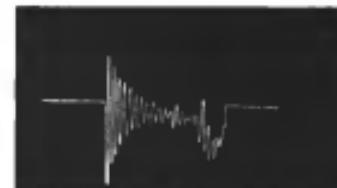
In connection with many other aircraft companies, Fairchild undertaken a certain amount of non-aircraft work during the war. The experience has been valuable, the report states. F. Carlton Ward, Jr., says in the report, Fairchild completed several months ago a subcontract for the production of four-wheel velocipedes for a top manufacturer, but "various stations in connection with this endeavor still in dispute." Desselbeld division was manufacturing cabinets for radio firms with carbons and oscillators. Int. spring, and Fairchild is now engaged in shipyards with one of the former customers. Desselbeld division is now in liquidation.

► **Own Share Corp.**—Fairchild has now acquired 100 percent ownership in Stinson Corp., of which it previously owned but 50 percent. Stinson's 1946 sales were \$1,522,000. It has suspended production on its main commercial order for passenger equipment, but is pursuing military projects.

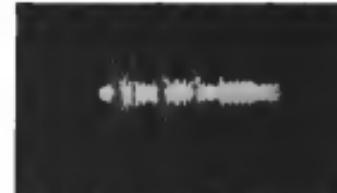
Fairchild's net working capital at the end of 1946 was at a new high of \$11,916,875, of which \$4,815,094 represented cash, and \$5,106,175, net revenue. Compared to some other companies in the industry, this can be considered a very favorable inventory situation, much of it presumably is for the Paket.

Planned deliveries in 1946 totaled 79 (by Aug. 31, of this year, 144 had been delivered). Program toward completion of the Paket order is reflected in the company's backlog figure. About \$53,000,000 in Dec. 31, 1946, and approximately \$78,000,000 on Aug. 31. Of this amount, 76 percent is held for military production, with commercial production five percent, and military research and development, 17 percent.

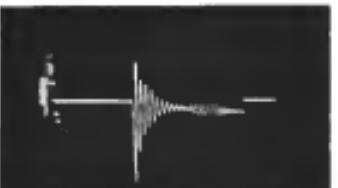
► **Opening Profit**—On sales and other income of \$48,051,075 in 1946, Fairchild lists an operating profit of \$639,019, only slightly below its operating profit of the previous post war year. For 1946, only three other major companies (North American, Martin, Convair)



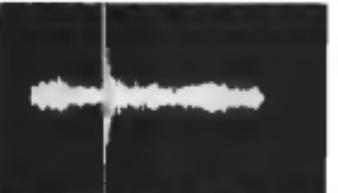
SPARK PLUG NORMAL. Scope in the plane shows this pattern when a spark plug is tested and is functioning properly. Various faults, such as shorting, too large or too small gaps, produce destructive patterns.



SPARK PLUG BAD. The pattern of a faulty plug shows this noise-like signal for a normal plug, but changes in a dead short. Erratic charging of the leading resistance with such small gaps produce destructive patterns.



SPARK PLUG NOISE. The pattern of a faulty plug shows this noise-like signal for a normal plug, but changes in a dead short. Erratic charging of the leading resistance with such small gaps produce destructive patterns.



SPARK PLUG NOISE. The pattern of a faulty plug shows this noise-like signal for a normal plug, but changes in a dead short. Erratic charging of the leading resistance with such small gaps produce destructive patterns.

ENGINE CYCLE NORMAL. Proper functioning cylinder produces this pattern on the scope by recording vibrations from each of the four main actions (left to right), exhaust closing, injection, intake closing and combustion.

ENGINE CYCLE OFF. This pattern records result of an engine valve setting improperly. It is easily spotted by small size of the engine, left gap, injection is off and combustion is absent. Only the intake is normal.

## Engine Analyzer Pinpoints Flight Trouble

Instrument furnishing positive indications of a variety of failures aids safety and minimizes servicing delays.

An electronic engine analyzer capable of detecting a variety of engine troubles while the aircraft is in flight has been put into production by the Garrett Gas Turbine Co. after years of development in a co-operative industry situation and a thorough testing in airline operations.

With it, a plane's crew can pinpoint ignition or combustion failures, and then have precise information on which to base the flight pattern, and also be able to observe the ground crew, after landing, of the exact nature of the trouble and thus speed servicing.

The analyzer is the result of collective effort between airline operators, engine builders and Sperry, and was recently demonstrated at a conference sponsored by Commercial Space Propulsion Co. which has been conducted by the American Association of Aviation Engineers of Lockheed Corporation. Depending on the type of installation, the analyzer will cost about \$3,500, weigh about 45 lbs.

► **Money-Saver**—Oftentimes trouble with the development of the device occurs due to the engine's vibration, which can interfere with the analyzer. For this reason, Garrett has put into the engine a vibration sensor which monitors the engine's load up to \$10,000 to \$12,000 a day.

These little plates have 224 spark plug holes that have to be checked. The flight analyzer will check them all in a few minutes, not just on the ground, but also at high altitudes and during climb and other short flight conditions when faults develop that cannot be located by ground tests.

A service it has demonstrated is ability to increase safety by indicating all of the trouble developments in engine trouble, thus enabling the flight crew to take such factors into account. It is addition, by indicating

the exact nature of engine operation, the analyzer permits voice efficient aircrew control.

► **Two Functions**—The electronic engine analyzer performs two distinct functions: (1) it indicates trouble and (2) it monitors the vibration sensor to indicate the engine's load up to \$10,000 to \$12,000 a day. Both these indications are plotted on a single three-inch, medium persistence, gain selector cathode ray oscilloscope tube indicator.

The particular indication is chosen by two switches, one selecting the type of indication, and the other selecting the complete engine or the particular cycle of interest. The indicator and switches can be either mounted in the flight engineer's console or in a rear seat pedestal. The amplifier and other auxiliary electronic circuitry necessary for producing the indications are in a separate unit which can be located where space is available.

A three plane guarantee is mounted on the auxiliary indicator drive of the

engine. The voltage produced by this generator follows the angular position of the crank shaft. By using this voltage (through auxiliary circuits) to control the sweep of the electron beam across the indicator, the signals displayed are shown in their position relative to the crank shaft.

Ignition Indication.—To display patterns of the ignition system, the magnetic voltage of the magnetic switch in the primary circuit is applied through an isolating section to the unrectified section of the indicator. Should a short circuit develop in the indicator circuit, the isolating section will protect the ignition system.

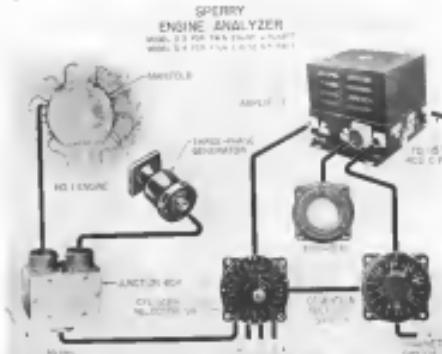
For observation of mechanical operation, indicators fastened to the outside cylinder walls are padded up by augmentation and secured onto each cylinder. Thus no holes need be cut in the inside cylinder walls. A short lead between connects these pads up to a cable that patches through a protection box in the fuselage to the indicator selector. The voltage selected is amplified and applied to the indicator.

Storage of major vibration shows that vibration amplitude is about 20 to 50 percent of normal during a flight maneuver. Using the vibration analyzer function, the flight engineer can observe continuously the behavior of all spark plug in an engine in any position as the engine is warmed up. Any plug that functions improperly is immediately identified and can be quickly replaced.

During flight, if a gong is observed to be faulty, the pilot can make corrective adjustments or change his flight plan for the sake of safety.

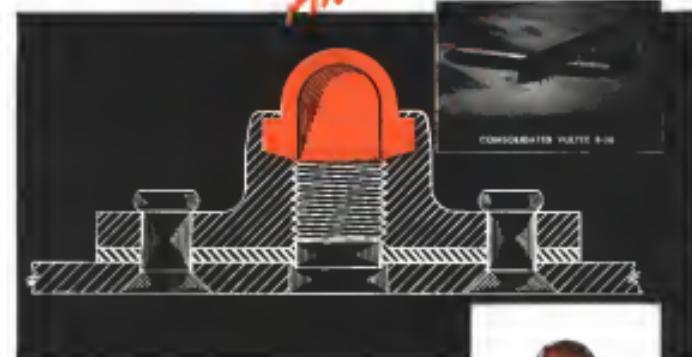
► Cylinder Indication.—Various return inside the cylinder produce their own peculiar types of vibrations. The valves, in opening, produce sharp, sharp vibrations. If a valve closes too slowly it produces low vibration; if it is closed too quickly, it produces high vibration. Whether slow closure was caused by the cam or by the valve striking. Injection produces a short vibration. Combustion produces long vibration; other engine operations usually low vibration.

The engine analysis has been developed through the cooperation research of John E. Lenthem, Jr. of Pan American Aviation, engineer of Wright Aeronautical Corp.; Chrysler Corp., and Sperry Gyroscope Co. General test facilities were provided by Wright where an experimental unit is installed for flight research and training of engine flight personnel. Testing for the analysis is being carried on by Boeing Structures, now under construction. Aeronautical manufacturers are interested in the equipment for their test facilities. Thus, not only is the analyzer useful in flight but also in engine testing and development and for test technology.



COMPACT: Small size of the indicator unit is shown here in its position at the flight engineer's station. It can be mounted in the console, or in a separate pedestal.

**NEW!**  
**SELF-LOCKING**  
*Nylon Cap*  
*Anchor Nut*  
**UNAFFECTED BY**  
**GASOLINE \***



—The Red Elastic Cap and Collar is molded in one piece to prevent LIQUID SEEPAGE!

Gasoline cannot creep past the bolted connections inside the Delco engine tanks. This recent development is equipped with ESSM's latest development in self-locking, oil-sealing nut—the Nylon Cap Nut.

The nylon cap and collar is molded in one piece. It is impervious to the chemical action of gasoline and may expand with the cap prevents and seals the end of the bolt against liquid penetration. The Self-Elastic Collar with the red and white of the bolt, prevents liquid seepage. As an other ESSM Snap Nut the bolt must engage a full thread contact in the collar. The threading will produce a compression, and this

resists pressure against both the top and bottom sides of the bolt threads ... that insure a full thread contact and a dependable tight liquid seal.

Here again ESSM's Eastic Stop Nut provides dependable protection against vibration, Thread Corrosion, Thread Failure, and Liquid Seepage. ESSM can produce and research as shown at the disposal of the aviation industry. For more details about ESSM Nylon Cap Nut or how, when, where, where and under what conditions to use, contact ESSM, 1000 Avenue of the Americas, New York, New Jersey Sales Engineers and Distributors in principal cities.



The RED COLLAR AND CAP  
utilizing an ESSM product

is threadless and depends on the chemical action of gasoline—impervious to the bolt threads contact in the Self-Elastic Collar to fully grip the bolt threads. The Nylon Cap Nut is impervious to gasoline—resists the metal threads—and eliminates all water play between the bolt and nut.

All ESSM Nylon Cap Nut—regardless of size or type—will be produced exclusively in heat treated steel. Threaded, impact or other essential features dependant on particular settings.



"The nylon cap and collar may be used in refrigerated airplane tanks, in aircraft fuel tanks, such as combustion and incomplete combustion gasoline tanks, in aircraft hydraulic systems and aircraft."

## ELASTIC STOP NUTS

DISMANTLED  
ASSEMBLED  
WING  
INSTRUMENT  
ROTOR  
TIP  
RAIL  
CABLE  
STEER

PRODUCED BY ELASTIC STOP NUT CORPORATION OF AMERICA

# FEATHER-WEIGHTS

COOL MARTIN 2-0-2  
AND 3-0-3 TRANSPORTS

The new Martin 2-0-2 is a highly advanced transport design, featuring a pressurized cabin for high altitude flying and jet assist. The aircraft has a maximum speed of 360 to 380 passengers at speeds up to 800 mph. The plane, together with its six pressurized sister ships, the 3-0-3, has been entered in greater quantity than all other twin-engine transports combined.



Marking an important step forward in air transportation, the Martin 2-0-2 and 3-0-3 represent a combination of many engineering achievements. Their FEATHER-WEIGHT all-aluminum oil coolers for example, were especially developed in the largest, most modern wind tunnel laboratory in the aeronautical heat exchanger industry.

FEATHER-WEIGHT all-aluminum oil

coolers are inherently light, strong, compact...withstanding the most severe conditions of temperature, pressure, vibration and shear which usually cause oil cooler failures.

Inquiries concerning FEATHER-WEIGHT oil coolers are invited. The Clifford Manufacturing Company, 561 E. First Street, Boston 27, Massachusetts. Offices in Chicago, Detroit, Los Angeles.

# CLIFFORD



ALL-ALUMINUM OIL COOLERS  
HYDRAULICALLY-FORMED BELLOWS



## Extra Kick for Jet Engines

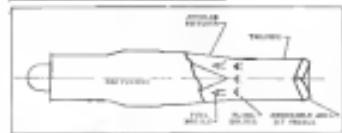


Fig. 1. Turbopipe afterburner



Fig. 2. Liquid injection

## Thrust Augmentation Offers Power Gain

Increase of 100% available through new methods of auxiliary burning at high speed; research revealed.

By ROBERT McLAUGHLIN

The principal failing of the turboprop engine's dependency on thrust for rated speed for high power and efficiency—may soon be overcome through the use of "thrust augmentation," the burning of additional fuel in the system. One of these methods, turbopipe afterburning, offers 100 percent increase in turboprop engine thrust, offering a jet fighter twice its normal power for fast acceleration in combat.

Nonetheless other methods, including water injection, offer short-term increases of up to 50 percent for auxiliary use. All of these gains, however, are accomplished only at the expense of a greater increased fuel consumption considered feasible only in high-speed military applications.

► **Efficiency Penalties**—The low power output of the turboprop engine at low airspeed greatly increases the bleed-off distance of jet-powered aircraft over propeller-driven types. For example, the Lockheed P-38A Shooting Star, current standard Air Force jet fighter, requires 4-1/2 ft. to get off the ground at sea level. A Lockheed Constellation, high-speed 50-passenger aircraft, is off the ground and over 100 ft. in the air at this distance under the same conditions. The comparative inferiority of the turboprop engine results from inherent characteristics of performance.

In the first place, the engine is designed for normal operation at about 85 percent of its maximum thrust, which provides a very narrow margin of excess power for takeoff or acceleration in flight. By comparison, the reciprocating engine is designed to operate at 50-60 percent normal rated power, and up to 120 percent normal rated power may be drawn from the engine for emergency use. The nonoperating engine can provide from 100 percent to 140 percent excess power for takeoff over that required for steady level flight.

In addition, the propulsive efficiency of the turboprop engine is inherently lower than that of the reciprocating engine at low speeds. This efficiency is a function of the useful energy of the moving air and the energy wasted in the dissipation.

► **Efficiency Penalties**—
$$\text{Efficiency} = \frac{m_1 V_1 - V_0}{m_1 V_1}$$
 in which "thrust" is the net thrust produced in the mass,  $V_1$  the speed of the propeller, and  $V_0$  the speed of the jet.

$$\begin{aligned} \text{Wasted energy} &= \frac{m_1}{2} (V_1 - V_0)^2 \\ \text{Propulsive efficiency} &= \frac{m_1 V_1 - V_0}{m_1 V_1} \\ &= \frac{m_1 V_1 - V_0}{m_1 V_1} + \frac{m_1}{2} \frac{(V_1 - V_0)^2}{m_1 V_1} \\ &= \frac{1}{1 + \frac{1}{2} \frac{(V_1 - V_0)^2}{m_1 V_1}} \end{aligned}$$

It is evident a large value of  $(V_1 - V_0)$ , the change in velocity of the air, produces a low value of  $m_1 V_1$  propulsive efficiency, whereas a low value of  $(V_1 - V_0)$  produces a high efficiency. The reciprocating engine driving a propeller produces a small change of velocity at a large mass of air, thereby offering high efficiency. The turboprop engine, despite a high change in velocity at a small mass of air, offers the jet and, thereby, greater low efficiency.

These considerations indicate the necessity for some form of auxiliary power for a turboprop engine-powered aircraft to provide the high power and efficiency demanded for takeoff and high acceleration during flight or in critical situations such as the "wave-off" from an aircraft carrier.

To obtain the extra power, the Air Force, Navy, aircraft engine and aircraft manufacturing industry and the National Advisory Committee for Aeronautics are exploring several methods.

► **Turbopipe Afterburning**.—The principal operating limitation in a turboprop engine is its critical turbine inlet temperature. This temperature is determined by the mass of air from which the turbine blades are fueled, the speed of the turbine to which they are attached, and the size of the turbine and its blades.

In order to prevent this temperature from exceeding its safe value, an excess



Fig. 3. Jet engine

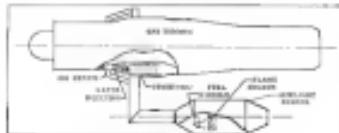


Fig. 4. Auxiliary burner

large quantity of air handled by the engine, the cost of the compressor is high. It is not unusual for a turboprop engine to use four or five times as much air as is actually required for efficient combustion to prevent excessive temperatures being produced by the combustion chamber. After burning takes place and the hot gases pass through the turbine, the excess air is passed out into the system in the form of wasted energy. Turbine after-burning (Fig. 1) attempts to make use of this excess air.

The hot gases leaving the turbine pass through a diffuser, which changes velocity energy to pressure energy and slows down the gases to permit additional burning in the tail pipe by introducing fuel through a spray ring or a series of spray nozzles. An adjustable tail pipe is required to accommodate the increased mass flow.

Since the after-burner does not affect the turbine blade temperature, after-burning air lost for a much higher temperature than is generated in the combustion chamber located ahead of the turbine. The addition of the fuel in the tail pipe raises the mass of the jet gases and the burning is caused by the gas temperature, thereby producing higher jet velocity.

Both of these systems produce greater thrust up to 40 percent during takeoff and up to 100 percent at high aircraft speeds according to recent test results. After-burner requires a tremendous expenditure of fuel and, for this reason, the use is limited to takeoff or for emergency only.

**Liquid Injection-Turboprop** engine may be increased by the injection of water into the inlet of the compressor (Fig. 2). This water is easily mixed with fuel to prevent its freezing at high altitudes. This mixture is created by two factors:

Lower temperatures—Evaporation of the water in the compressor causes to lower the temperature of the air during its compression. This provides an increase in the compression pressure ratio because of the relatively rapid adiabatic compression. The higher combustion chamber pressure also produces higher jet velocities, resulting in greater thrust.

Increased mass flow—The decreased compressor outlet air for combustor inlet temperatures permit the burning of more fuel with attendant increase in mass flow without exceeding the critical turbine temperature.

Water injection is limited in its effectiveness at a thrust augmentation system by the amount of liquid that the air in the compressor can absorb without exceeding saturation. However, thrust increases of the order of 30-55 percent have been obtained in tests, with a figure of 55 percent possible.

**Int. Ejector**—The small mass of air supplied by the turboprop engine may be considerably increased through the use of large air nozzles or exhaust nozzles, convergent-divergent nozzles attached to the tailpipe (Fig. 3). This system draws additional air into and inside the engine and induces it into the jet through expansion of the hot gases within the engine.

A properly designed system can jet air throat increases as high as 25 percent at low speeds (such as during takeoff) and 50 percent at high speeds. It can also be used to cool the engine by drawing the air through a duct surrounding the engine. This system is used on the Convair Liner for cooling of the compressor.

Propeller characteristics of this system are the weight and cost of its installation and the fact that it does not provide added thrust for sudden bursts of speed without an extremely complex design incorporating a retractable spinner with variable tips.

**Auxiliary Burner**—The auxiliary air, previously mentioned, may be utilized by directing it into add-on combustor chambers (Fig. 4). In this system, about 20-30 percent of the air delivered by the compressor is bled off and directed to a separate combustor. There the air is mixed with fuel and burned at a higher fuel-air ratio than in the main burner. Because of the high pressures and temperatures generated, the hot air can not pass through the main high pressure system and is instead directed into the main flow through the turboprop engine as hot bleed air by the auxiliary burner or by the auxiliary chamber.

Large amounts of thrust (depending upon the number and use of auxiliary chambers used) can be added, in this manner. However, it requires the addition of complex equipment to the engine, the combustion chambers, water injection equipment and add-on combustor system, which is costly. This method is also extremely heavy.

**Int. Assisted Take-Off**—The familiar ATG unit, which has been used on both military and commercial aircraft in a large variety of types, consists of a powder rocket which is fired when additional thrust is required. Powder rockets, however, cannot be controlled once they are ignited and they must burn through to exhaustion before the additional thrust ceases. Experiments are now under way utilizing liquid fuel rockets for this purpose, the thrust from which may be easily and accurately controlled by valves in the fuel supply system. An important use will be added increase in thrust for accelerating through the sonic speed regime.

**Auxiliary Engine**—By installing additional turboprop engines in large aircraft, the auxiliary thrust necessary either for takeoff or for high speed acceleration, can be provided, either on jet aircraft or those powered by reciprocating engine-propeller combinations. These auxiliary engines may be smaller than the main engines and a typical example is the Douglas XB-41B Marauder, which, in addition to its engine involving propellers at the tail, mounts the Wright 19B2 turboprop engine under the wings.

In order for a thrust augmentation system to merit wide application, it is necessary that there be a minimum increase in weight, drag and maintenance requirements. From this point of view, the augmented aircraft system offers the greatest thrust augmentation for comparatively small increases in thrust and the tailpipe after-burning volume for maximum thrust increase.

Both of these systems produce greatly reduced fuel (or liquid) consumption with increased thrust weight and space for short bursts of power this is not serious. Both systems are flexible in operation, providing a wide range of augmentation values to meet specific tactical needs.

NACA is actively working on both

of these systems in an attempt to reduce the fuel consumption and improve their efficiency. It is also giving consideration to the auxiliary burner system with particular emphasis on reducing its complexity.

All of these methods are designed to accommodate differences in the turboprop engine itself and are, therefore, comparatively inexpensive equipment. It will only be through effective improvements in the turboprop engine that really important gains in thrust availability will be attained and it is to this fact that the greater portion of the research and development effort is being directed.

### Plastic Glass Developed Suitable for Airframes

Research at Northrop and other aircraft factories has resulted in the production of monolithic aircraft structures composed from all-glass fiber laminated with thermosetting plastic resins.

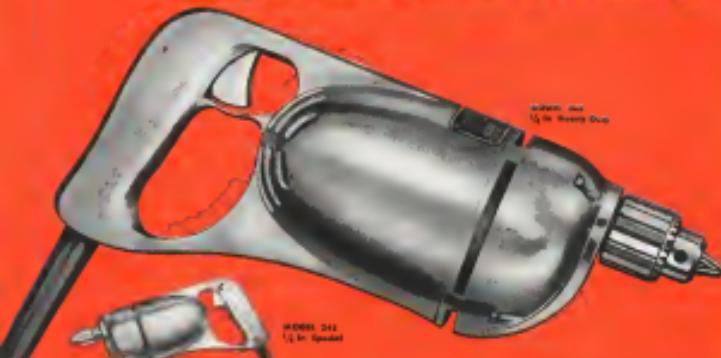
Northrop large aircraft parts have already been fabricated from these glass and plastic laminations and it is believed that before too long some manufacturers will successfully construct an entire aircraft through this method. Reportedly, the vertical stabilizer of the Marine PBM is of fiberglass.

Advantages offered include simplified production methods, greater vibration damping, greater strength weight ratio in relation to stiffness, and greater safety, since plastic structures do not retain heat.

The advertisement for Curtiss Electric Propellers highlights the following features:

- SYNCHRONIZED CONSTANT SPEED CONDENSER:** An aircraft with a propeller and a small inset showing a cross-section of the propeller hub.
- REVERSE THRUST:** An aircraft shown from a rear perspective with its propeller in reverse.
- SWALLOW TAIL FINS:** An aircraft with a unique, flat-topped tail fin.
- SELECTIVE THROTTLE PITCH:** An aircraft with a propeller showing different blade angles.
- NO other propeller gives all these advantages:** A large text headline.
- EVERY FEATURE PROVED AND IN SERVICE:** A statement below the headline.
- CURTISS ELECTRIC PROPELLERS** (with a logo)
- PROPELLER DIVISION CURTISS-WRIGHT GARDNER, N.Y.**
- ALL-INTERMEDIATE REVERSIBILITY** (with a propeller icon)
- UNIT REVERSIBILITY** (with a propeller icon)
- FLEXIBILITY OF INTEGRAL CONSTRUCTION** (with a propeller icon)

# 7 NEW SKIL DRILLS\*



...with 7000 uses in your shop!



SEND FOR  
FREE FOLDER

A Three new Skil Drills are so compact, lightweight and powerful... so handy in so many jobs that it's almost impossible to exaggerate their usefulness. And like all Skil Tools... the 200 Series Skil Drills represents the latest developments in Skil Tool engineering, design and craftsmanship... your assurance of top tool value per dollar invested. See your Skil Tool Jobber today!

SKILSAW, INC., 3033 Elston Ave., Chicago 30, Ill.

Factory Authorized in Principal Cities

In Canada: SKIITOOLS, LTD., 66 Portland St., Toronto

## SKIL TOOLS



MODEL 241  
1/2" Heavy Duty

MODEL 242  
1/2" Heavy Duty

MODEL 243  
1/2" Heavy Duty

MODEL 244  
1/2" Heavy Duty

MODEL 245  
1/2" Heavy Duty

\*SKIL Drills are made exclusively by SKILSAW, INC.

## NEW AVIATION PRODUCTS

### Self-Lock Not for High Heats

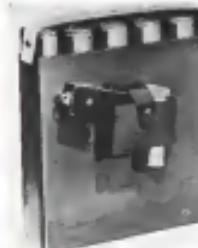
Model self-locking hexagon nut, produced by Bremi Aircraft Nut Co., Springfield, Conn., has recently received AN approval in all such use parts and made to combine corrosion-resistance qualities with varying temperature accommodations (up to 400 deg. F. to 100 deg. C.)



smooth snap). Locking operation is due to nut grip spring action and produces vibration-proof grip on threads of bolt. Stainless steel hexnuts are easier going in cramped parts

### Flare Kit for Personal Flyers

String in weight and compactness is one important feature of portable flare kit now available to give personal flyers the protection of emergency landing flares. Approved by CAA for night operations in planes up to 3,500 lb gross weight, kit includes five 1 min. chisel flares and a 37 mm. flare pistol packed in fire resistant cloth-covered fiber container, the whole weighing 11 lb. Each flare generates over 75,000 ip. for more



than a minute. In operation, pistol is fired over face and around by thumb-activated breach lock. After flare is fired, release of breach lock allows spent case to drop out of pistol. Manufacturer is International Flare Div., 804-906 N. High St., Westerville, Ohio.

### Pitch and Yaw Transmitter

Newly offered in line of Autoflight instruments for radio controlled model and guided missile is compact single shaft yaw rate gyro type transmitter which rotates in standard pilot tube unit, with indicating values geared to microswitch potentiometers. Mechanical sum of rates is converted into an electrical signal which is sent from plastic case to ground for reading. Each case has its own microswitch, and the accuracy of these cases is stated to exceed that of the gyro linkage. Units are designed to use up to 800 m-cu-in of torque to transmit a signal. Electronically, they transmit the resistance specifications



measuring from 100 to 20,000 ohms. Range of attenuation is termed better than 1 deg. in range of resistance over 5,000 ohms. Maker is G. M. Gimbell & Co., Pasadena, Calif.

### Oil Conditioner vs. Engine Wear

Lubricating oil conditioner units for use as aircraft engine oil are now offered by Winslow Engineering Co., Oklahoma City, which states these devices reduce power plant oil consumption and overheat engine. Units are available in three sizes for installation on engines up to 150 hp; conditioner incorporates company-designed element giving progressively finer filtration of oil as it passes from outside of element to inner case. Material is emphasized that transformer seeds and removes water without



affecting elements in compounded oil. Winslow reports oil at original qualities, and filtering makes for clear emulsion and oil-sealing free from sludge, carbon, and dust particles. Dry weight of unit ranges between 21 and 31 lb., according to size of unit. CAA approval specifies use on engines with maximum oil pressure of 15 lb., and installation is to be as short as may be with mounting in without vibration using flexible inlet and outlet lines. Photo shows machine applying this filter on a commercial filter on 75 hp. engine.

### Gated Media Vacuum Tube

Vacuum tube for high voltage operation at heights up to 60,000 ft is now offered by Aerogenics Electronic Corp., 25 Washington St., Brooklyn, N. Y., the first being particularly intended for control circuits of guided missiles. Developed through sponsorship of Air Materiel Command, the tube is of high-current, low-power rating, made at 14,000 Vppc. current. It can deliver an average plate current of 225 ma. and a peak plate current of 250 ma. Threshold at each 34,000 V. peak, tube socket conduction will handle voltages as high as 35,000 V. peak. To make sure socket installation is ahead of all air (which at high altitudes causes free-flow between transistors), tubes have a shaped hot-glass bulb stopper. It fits into a glass-to-metal seal made of Molykote, a heat-resistant glass base composition which will not carbonize.

### Welding-Type Aircraft Cleaner

New type aluminum and metal cleaner for use in aircraft field is Nev-Del, a chemically impregnated cotton wadding designed for direct application to metal surfaces. Superior later with less labor is claimed to be possible with product, which is stated to be safe in solvent for all personnel and materials, including transistors, and oil gear. It is also described as non-toxic, non-corrosive, having a protective film. This cleaner is manufactured by The Heath Co., 151 Broadway, New York, N. Y., which is an aviation consultant and engineering firm acting as sole distributor for maker, George Beach Co.

# Douglas DC-4 Lubrication Simplified by Sinclair



Sinclair's popular DC-4 Lubrication Chart, based on 15 years of practical experience, is a major step toward simplification of aircraft lubrication. It enables maintenance crews to do a thorough, safe, commendable lubrication job on every mechanical detail of the giant DC-4's, with just four lubricants!

In this way, lubricant inventory is held to a minimum... maintenance costs are kept appreciably lower. Write for your free copy of this useful, time-and-money saving DC-4 Lubrication Chart.

## SINCLAIR AIRCRAFT OIL

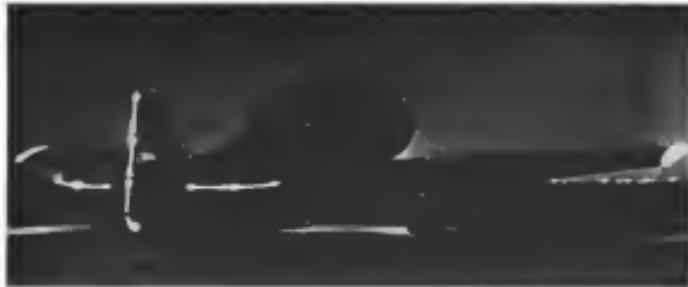
*Symbol of Flying Dependability*

Commercial airlines, private fliers, and aircraft manufacturers have found dependability SINCLAIR-SOLVENT oil just as dependable in peace-time aviation as it was proved to be in bomber, fighter, and transport engine lubrication during the war.

The high regard in which engineers of major airlines, using famous DC-4's, hold SINCLAIR AIRCRAFT oil speaks for itself. For safe, sure aircraft engine lubrication, go with the DC-4's — go Sinclair.

**SINCLAIR**

SINCLAIR REFINING COMPANY, AVIATION SALES  
630 FIFTH AVENUE, NEW YORK CITY



## Navy Develops Novel Airplane Lighting

Use of Plexiglas and Lucite illuminated by internal light combats night flying problems.

After three years of intensive experiments at its Aero Medical Research Laboratory at Philadelphia, the Navy is testing the double system in efforts to improve identification lighting of aircraft to make night operations safer and more efficient.

The critical nature of the problem has been pointed up by the Navy with authentic accounts of pilots at night flying "operations on a star," and at least one case in which a student pilot crashed after following the red tail light of a friend under the illusion that it was an other plane.

To eliminate that, and other types of confusion, the Navy is now experimenting with three planes at Philadelphia, each employing different arrangements of external lighting to serve as the best system, and is making suggestions for further improvements.

In addition to the external lights, these planes have new types of cockpit and instrument illumination.

▲ **Anisotropic Illusion**—Man's difficulty the work is directed toward overcoming what is known as "anisotropic illusion." Simplest explanation of this effect is that if a person is in a dark room in which there is only one small light, and he focuses his eyes on it, in a short time the light will appear to move. The distance movement will vary according to the distance at which the person is, and the rate of movement will increase as the distance increases.

The experiments at Philadelphia, under the direction of Capt. J. R. Poppens, Navy Medical Corps, have concluded that the following arrangement of lights used on an aircraft places it "in effective range of making the plane distinctive and of allowing an observer to determine its distance and direction."

► **Wing Tip Reference**—The wing itself is a good visual reference to pilots since its two ends are easier to see after parts of the plane, giving information as to change in orientation quickly. However, the flat edge of the wing is difficult to see at night. This makes it difficult for an illuminated wing tip to be a definite, hence more comfortable, visual reference in night flying.

The use of Lucite, Plexiglas or other suitable plastic capable of being illuminated by internally reflected light provides several advantages for this method. It can be shaped to any desired form, and can be painted to any desired shape with minute care, yet is tough and durable for adequate structural strength.

A complete wing tip was fabricated so that it contains two distinctly separate portions. The leading portion is clear and contains a standard position light, similar to that used on the P-51. The remainder has been painted on the outside so that its small loops will reflect internally this section. Each portion can be illuminated without affecting the other. The appearance when the light is on is that of a surface signal like an aileron.

► **Brightness Changes**—Following actual flight test, two brightnesses were chosen: a full bright position giving a



**BERRYLOID**

*The Standard of Excellence*

in aircraft finishes

For durability, protection and beauty... Berryloid Aircraft Finishes have been the standard of excellence in all types of plane finishing for over 30 years. It's only natural, then, that Berryloid is the choice of most of the nation's leading aircraft manufacturers... the reason why many of the new planes you see are protected by Berryloid Aircraft Finishes.

For new planes on the production lines and in the maintenance of planes now in use... insist upon the protection and beauty of Berryloid Aircraft Finishes.

\*Berryloid, for maintenance and refurbishing, is exclusively distributed by AIR ASSOCIATES, INC.

**BERRYLOID**

AIRCRAFT  
FINISHES

Bethel  
Englewood, Calif.



Jersey City • Cincinnati • Chicago • St. Louis  
Montreal • Worcester • Toronto

**BERRY BROTHERS, INC.**

# Turn those waste pounds into dollars!



Many airplanes of the future will carry heavier payloads faster and cheaper because of Aeroprop's weight-saving design.

With its strong, hollow, steel-drawn blades and simplified unit construction, the Aeroprop offers demonstrable weight-saving advantages. Moreover, being hydraulically actuated, there are no supplementary weight factors to add further weight and design com-

plexities. Both improve ratio of payload to gross weight. Aeroprop simplicity, moreover, assures dependable, long life, while to its



unit-construction gives much of the credit for the ease with which it is installed and serviced.

We're busy now, design these characteristics into Aeroprop's custom-tailored to meet requirements of airplanes yet to fly. Turn to Aeroprop—backed by the research and production facilities of General Motors—the answers to your future needs.



# Aeroprop

GENERAL PRODUCTS FOR AIRCRAFT POWER  
RESEARCH PROGRAM TO MEET TOMORROW'S NEEDS

This is the Aeroprop—an hollow single or dual-blade with torque-limiting, reverse pitch, electric de-icing, and other features required for any installation. Repairs, hub and blade assemblies are designed for quick installation or replacement. It's strong, light and simple.

AEROPRODUCTS DIVISION • GENERAL MOTORS CORPORATION • DAYTON, OHIO

AVIATION WEEK, October 26, 1947

surface brightness of about 10 anti-blasters is useful for recognition and rapid jettison procedures, obtainable in a wing by up to a distance of several hundred yards. For formation flying a much lower brightness of about 60 ml extinction, the perception of which is not affected by the aircraft's motion, is usually the "one" of the cockpit staff is enhanced by the alteration.

► **Light Through Luster**—The method of certain lighting outlining the valving edges of the rudder and elevator makes use of the fact that light is conducted through metal lucite. Lucite strips were sheared and fitted to the trailing edges of the rudder and elevator of an SNJ intermediate trainer aircraft. Flight tests indicate that any dynamic disorientation of the elevator and rudder are not seriously affected.

Blossomette is provided at each end of each bar by small lenses to light night landings. The lenses are so designed, however, as to give the bar a uniform light intensity. When illuminated, and observed from the rear, one sees a line of light whenever there is Luster.

Putney Lights enhance the plane for a distinctive appearance when seen at night up to a mile. This appears to be particularly useful in facilitating recognition and rapid jettison.

There is little difficulty in achieving this desired "IT" appearance against a confused background of lights over the criss in a the traffic circle. Rate of closure is easily determined and quickly made. Full bright position gives the surface of the Luster brightness values of from 2 to 6 ml extinction. In addition, pilot gather the distinct lighting of about 15 ml extinction which is just perceptible; brightness enhancing but not obscuring the usually significant parts of the tail control surfaces and place itself.

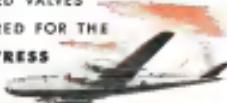
► **Second Phase**—In the second plane of the project, cockpit and instrument lighting the Aero Medical Equipment Laboratory is investigating methods of eliminating the form of heat-penny illumination that stems from illumination of panels with bright white light. It has been found that red and ultraviolet light, being at the opposite ends of the color spectrum from white light, do not produce the same effect. It is therefore proposed to eliminate the pilot has acquired after being on the job at night for some time.

The Laboratory's work has involved the placing of red and light behind the instrument panel so that when uniformly light the duals of the instruments, the multitude of small red individual lights around the edges of the fixture tends to light them either directly, or through Luster, the direct illumination of instrument duals with ultra-violet light, and the localization of place of red and light to shine upon the most important head.

## ASSEMBLY LINE PRODUCED VALVES

### INDIVIDUALLY-ENGINEERED FOR THE

#### BOEING SUPERFORTRESS



In developing the giant, new B-52, Superfortress, Boeing engineers selected Whittaker Motor-Operated Valves for control of the vent fuel system. To meet the specialized requirements of the B-52, Whittaker engineers redesigned the basic control valve system to include a special mounting adapter. It is this individual engineering of field-proven designs, combined with modern, assembly-line production techniques that make Whittaker valves the leading choice among the leaders in the aircraft industry.



DESIGN FEATURES OF WHITTAKER MOTOR-OPERATED VALVES



**VALVE HEAD**—Indicates Whittaker design and construction features as follows: (1) The valve head is a single casting which is self-sealing. (2) The valve body is a single casting.



**VALVE BODY**—Indicates the main construction of the valve body, which is a single casting. The valve body is a single casting.



**VALVE BODY MOUNTING**—This is of robust, quiet, gear-type construction, designed to withstand extreme vibration, shock and impact. It is a single casting which is self-sealing.

Whittaker has increased the development of over 150 different valves for the aircraft industry. Whittaker's staff of design engineers will collaborate closely with your engineers to meet your specific requirements. Write our Engineering Sales Dept. for complete information. **WHITTLAKER CO., LTD., 945 N. Cahuenga Ave., Los Angeles 16, Calif.** **Eastern representative—Aero Engineering Inc., Roosevelt Field, Mineola, New York.**

# Whittaker

## DESIGNERS • MANUFACTURERS • DISTRIBUTORS

LEVER AND MOTOR-OPERATED SWING GATE • BENT-OP VALVE • DRAIN COCKS • PLUG VALVE • D-WAY PLUG VALVE • AIRWAY SELECTOR PLUG VALVE • SWING CHECK VALVE • HYDRAULIC CHECK VALVE

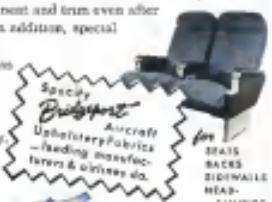
ENGINEERING-PRODUCTION



## FLIGHT PATTERN . . .

to suit discriminating tastes

Air travelers are among the most discriminating. They are quick to appreciate and remember neat, clean and beautiful aircraft interior appointments. Bridgeport Aircraft Upholstery Fabric, specially designed for plane cabins, offers distinctive patterns and colors to fit harmoniously with other interior furnishings. Made of finest quality, closely woven wools and wovens, Bridgeport Fabric is extremely lightweight and long wearing. It has a soft, smooth surface that does not cling to clothing and feels as soft and cool as chamois. Because Bridgeport Fabric is 100% wool, woven flat with no rough cotton backing, it will not support combustion and is highly resistant to stains and dirt. It looks neat and trim even after long cross-country trips. In addition, special construction features cut installation time so much as 20% to put your planes in service sooner. Write for complete information and free sample swatches today.



**Bridgewater FABRICS, INC.**  
BRIDGEPORT 1, CONNECTICUT

## Pentecost Building New Hoppieopters

Homopteran, Inc., of Seattle, Wash., expects to step up its flight test program within the next two months when construction of two additional models is completed, according to Henry Pennington, president.

The new article, designated 109 and 114, will be very similar to model 102, on which several hours of flight tests have been accumulated, so that the man-  
age at a base, both in a captured condition within a hangar and in a free condition outdoors. No attempt will be made to return altitude, with flights held to within five or ten feet of the ground.

**\$330,000** Capital-Pentcost had hoped to exhibit his one-man hangar at the Cleveland Air Races but decided it would not be wise to do so with only one completed model. With three aircrafts available, one should always be ready for flight test, he believes.

Company is supported for \$100,000 with Friends, as president, holding 50 percent of the stock. E. C. Goodman, investment man, is vice president. Ross Allie, scratch builder, and David E. Wyman, builder man, Theodore S. Hodges, northeast manager of Brookfield Classics, and Todd Smith, patent attorney, are directors, in addition to Frostine and Allie. The officers and directors, other than Frostine, control about 15 percent of the stock, with the new individual among some 140 shareholders. As of Sept. 1, 60,000 shares of \$1 par value had been issued and sale of the remaining shares

Present capabilities are intended to finance construction and testing of the first three reactors. Additional financing will be necessary for a production and sales program.

Pearlman has been giving much of his attention to the Hoppelmann engine. The engine he is using presently is modified from his first engine, all of the same type but made by different companies. An unidentified eastern concern is designing a new engine especially for the Hoppelmann, but production cannot be expected before early next year.

**Seek Foreign Trade.**—The company at present has no plans to apply for CAA certification. Pentecost feels the Houghton plant does not belong in the helicopter classification but is in a category by itself. Because establishment of such a new category with the CAA would be expensive and time-consuming, the company is studying the possibilities of selling several machines as the export model, thus obtaining the advantages of service tests before going to the CAA.



THE FOAMICA INSULATION COMPANY, 4628 SPRING GROVE AVENUE, CINCINNATI 33, OHIO

Phillips fuels your flight at

# Tradewind Airport

AMARILLO  
TEXAS



Tradewind, the first Approved Repair Station in West Texas, accommodates 20 airplanes and provides a hangar for Amarillo Aircraft

Mr. Shirley M. Koenig has been in charge of construction since last October. Day-to-day management is in the hands of the manager, a product of the top training, new Tradewind Airport.

A Phillips 66 tank truck with a capacity of 300 gallons, refuels a private plane at the Tradewind Airport.



THE AMARILLO CITY of Amarillo boasts a new airport, called the Tradewind, built and operated solely for the use of private planes. Located just northeast of the city limits, this modern air field is the first in the country to use runway marked with luminous green and kept in the peak of condition by underground, high pressure irrigation.

Just as a man is known by the company he keeps, so you can judge the quality of Phillips 66 Aviation Gasoline by those who use it. At the Amarillo Municipal Airport where the big day-hoppers prefer ... as well as at the many, modern, facilities at Amarillo, Amarillo Municipal Aviation, Phillips Petroleum Company, Phillips Service, Phillips Service, Phillips Petroleum Company, Phillips Service are well-known throughout aviation circles from the Dakotas to the Rio Grande!

Today, you can depend on Phillips 66 Aviation Gasoline. Phillips is one of the largest suppliers of high-grade fuel for the Armed Forces. If you need help with your aviation fuel problems, please write to the Aviation Department, Phillips Petroleum Company, Bartlesville, Oklahoma.



## AVIATION GASOLINE

AVIATION WEEK, October 20, 1947

# AVIATION SALES & SERVICE

## Firestone Aircraft Supply Stores Show 25 Percent Sales Gain

Sales head sees steady increase of airports, plane registrations, as encouraging sign of continued aviation growth and development.

By ALEXANDER McQUEARY

A 25 percent gain in business by the Firestone, Inc. & Rubber Co. national organization of more than 1,000 retail auto supply and tire equipment stores, Firestone, is to lead the aviation sales field in the fall of 1948.

Coming as it does in the face of a general sharp upturn in personal aircraft sales over the same period, the Firestone stores' sales gain offers an interesting case for analysis.

What makes the firestone operators with Firestone dealer franchises doing better than other operators not doing.

Asked about quality, Mr. Alvin W. Wiles, Cleve Clegg, manager of aviation tire products sales for Firestone at Akron, Ohio, replied: "Some of our dealers are not holding the bushes for business. And we are trying to get the rest to do likewise."

The encouraging growth in business is attributed more specifically to Clegg to the following principal factors:

- Frequent contacts between Firestone district representatives and local dealers on specific problems.

- Development of each representative from a special plan drawn up by Firestone for providing service to take advantage of available markets. This plan, he said, will be shown to the best advertising and stock will be conveniently accessible plus aid in making display arrangements.

- Holding down retail merchandise prices below or at least on a level comparable with prices of similar articles sold in other retail outlets.

- National advertising by Firestone of its aviation merchandise, aimed at the consumer.

- Local advertising programs using advertisements designed and provided by Firestone.

- Dealer meetings and sales clinics to stimulate new products and sales methods.

- Catalogs and other sales material produced by the Akron organization.

Bringing this development of aviation

outstanding individual dealers in various sections of the country assured for a considerable portion of the year for the first nine months of 1947 over the first nine months of 1946. Clegg pointed out, adding that their gains were then offset some losses incurred by other dealers.

Among national leaders in sales he cited:

- Auto Action Corp., Columbus, Ohio, increased sales 300 percent.
- tire Supply, Inc., Washington, D. C., at Roanoke, Va., increased 150 percent.
- Auto Living Service, Peoria, increased 100 percent.
- Keweenaw Aspex, Wadsworth, increased 100 percent.
- Washington Aspex, Seattle, increased 160 percent.
- Northeastern Air Service, Atlanta, increased 50 percent.
- Dallas (Texas) Auto Service, increased 40 percent.
- Omaha Aspex, Omaha, increased 20 percent.

- Northeast Aircraft, Vancouver, increased 20 percent.
- Typical of the sales and service business that is being built up through Firestone is the sale to dealers of a wide variety of aviation supplies and accessories covering the lines of Fire



TELEVISION AT TETEBOBO

A television program to acquaint the public with latest types of private planes was presented at Tetebobo Airport recently by the Tetebobo Chamber of Commerce. Tetebobo Co. has a radio station there, and the Chamber CCB and the Aviation Department, CCB, used the facilities of the Tetebobo Aviation Corp., who donated more than 60 calls on the day of the show from prospective flying students. Photo shows the camera being tested on Shirley Noddy, Atlantic's president, who "demonstrated" a Beech Bonanza, Cessna C-42 and Piper Cub, and Betty Jane Williamson, former Wasp and an outlet of the program.

share 'Sky Clermont' turns and takes. So far Bellanca discloses it has only one development in the aircraft field other manufacturers who use the aircraft field enter negotiations to use the aircraft parts as engine components, accessories, materials used and other equipment. The different types of aircraft parts made available for light and commercial aircraft, and other planes to catalog and price lists in other publications.

Service looks over some of the same material, but the various types and sizes of aircraft in the line, with loads and utilization for each, and then gives a detailed description of the type, suspension, mounting and bonding into one single one-operation stage with photo graphs of each step accompanying the detailed explanation of the operation.

With these taken, wheels and bodies are mounted on the aircraft, and the total merchandise sold, the salesmen supply with a wide assortment of items intended to provide a complete line of aviation supply goods except for aircraft engine parts and components of the aircraft.

Some of the items include radios, flying helmets, wrist chronometers, tools, batteries, switch tape, for extinguishers, pouches, depex, magnetic lights, gas pellets, log books, instruments, seat cushions, wind generators, windshields, curtains, headsets, etc.

Efforts are made to keep the dealers continually well stocked and they are assigned with postcards by the house office to communicate new arrivals, as which can take a few weeks, then write, and send it in without delay to enter a long sales letter.

Dealers are supplied with ample information material to show that their

bold Firestar franchises, including logo signs, window displays, stationery which has the Firestar slogan and quality the best in the field, and much more, and much more material for display, designed to entice.

Guided shows that his company is looking at an aviation supply store business as a "long pull" acquisition, rather than an immediate large profit market, and points to the steady, rising number of airports, and plane and pilot registrations, as indication that a healthy growth of potential customers for his company's merchandise is forthcoming. The business may be hard to get, he concludes, "but if it is there, we go after it hard enough."

#### Niagara Airport Fire

The second destroyed fire planes, a lounge and workshops at the Niagara Air Service airport near Niagara Falls, Ont. Loss was estimated at \$10,000 and a partly covered by insurance. The service was started two years ago by Peter Gangap, a veteran. He plans to build the airport.

#### New Bell Dealership

Bell Aircraft Corporation announced the acquisition of two new dealers, Harry Mitchell and James Thomas, who will sell Elmer Schleicher, a helicopter side engines, formerly with Bell and who has started his own company, Helicopter Service of California, at Chico, Calif. Mr. Schleicher has been awarded a Bell Helicopter dealer contract for Northern and Central California districts. Mr. Mitchell was the Army Air Force's first helicopter distributor.

#### Governor Stands Pat On Evans Ouster

Michigan's Gov. Kim Sarge has refused to take emergency action on the demand of the Aviation Association of Michigan (opposition group) for the ouster of Col. Floyd E. Evans for alleged breaking of the GI flight training program.

Evans, director of the Michigan Department of Aeronautics since 1929 except during World War II, has termed the AAM action "politically inspired" and points out that Michigan, with 12,000 GI enrollees, has 20 per cent of the total number of students enrolled in the national program.

A protest on charges brought against Evans by the flight school operators and airport managers was to be heard at the next meeting of the Michigan Aeronautics Commission.

Gov. Sarge himself is a pilot, commented: "I'm leaving the matter up to the commission, at least for the present, to see whether they can solve it."

Evans said that since operators and airport managers are criticizing him "for failure to keep them informed of loan liaison sites and other changes the Veterans Administration made in its requirements for student training contracts."

"The VA wouldn't give out information on training sites to anyone, including my department," he declared.

"Some operators are having a tough

struggle to comply with changing VA requirements and changes the added requirements made by the Michigan aeronautics department in the interest of greater air safety."



**AIRSHIPIAN CONVERSION**

Details of quick detachable propeller on the Fisher Amphibian are shown in this photograph of Robert E. Dalton, Jr.'s recent arrival at Washington National Airport. The propeller is of wood and is removed with less and then propeller is mounted from shaft with special holding tool which fits inside bats. There-



Wood propeller makes engine one of the quietest now flying. Photo shows automobile out of Amphibian rolling along heavy road just upstream from conventional personal plane, enroute to the airport, jets and the highway to downtown Washington (Press Photo Photo).

For feel-proof, feel-proof performance the world over,

# PIONEER PARACHUTES

## Are Standard Equipment



**P-3 soft, flexible  
Pack Pack PARACHUTE**

Standard equipment for the Air Forces of the U. S. Army and Navy and other government units, test pilots, leading air-craft manufacturers.



**P-30 Training PARACHUTE**

Flexible pack pack with newly developed safety device which automatically opens the pack when the pack is dropped — quick fit harness.



**AN-55 Military Model  
Seat type PARACHUTE**

Standard equipment for the Air Forces of the U. S. Army and Navy and other governments.



**Pioneer's Exclusive  
Quick-Fit  
Harness\***



**Just a Tie and  
It's Attached**

**Just a Tie**

**for perfect fit**



**PIONEER PARACHUTE CO., Inc.**

MANCHESTER, CONNECTICUT, U. S. A.

SOUTHWEST FACTORY BRANCH, LONE PINE, DALLAS, TEX.

Pioneer Parachute Co., Inc., is a Selling Agent for War Supplies Parachutes of the U. S. War Assets Administration.

\*Patent applied for in U. S. and  
selected countries throughout the world.



WHEN YOU HAVE TO  
CHANGE DRIVERS,  
YOU WASTE TIME.

ONE DRIVER FITS ALL SIZES OF  
REED & PRINCE RECESSED-HEAD SCREWS



Whether auto-exce driving or screw-driving — you waste time and speed when you have to change drivers! When you use the Reed & Prince ONE DRIVER method, you do not need to change drivers for varying screw sizes. There is no fumbling, no shifting, no wasting time. Remember, ONE Reed & Prince driver fits ALL Reed & Prince recessed-head screws and bolts. Good workmen appreciate this fast, modern, efficient method — and it shows up to advantage on your time sheet.

**REED & PRINCE**  
MANUFACTURING CO.  
CHICAGO, ILL. WORCESTER, MASS.

AVIATION WEEK, October 20, 1947

## Two Operators Get Goodyear Amphibians

Goodyear Aircraft Corp. has placed in third and fourth G-7 (Dakota) place amphibians, with Beverly, New Hampshire, Flying Service, Somers, Connecticut, S. C. and Southern Airways Co. Inc., Atlanta, Ga. The fifth was scheduled for delivery to J. D. Reed Co., Inc., Houston, Texas. Earlier deliveries were made to Atlantic Aviation, Teterboro, N. J., and Northeast Aviation, Portland, Me. The planes are being leased to these and other operators for an estimated service fee, in which the amphibians will be operated along with the operators' other equipment, to get operator and potential customer reactions.

## Sky Merchant In Ohio

The Standard Oil DC-4 metropolitan plane, Atlanta Sky Merchant, is at Columbus, Ohio, starting a tour of Ohio cities, which will continue until Nov. 5. Other cities visited will include Akron, Canton, Cincinnati, Dayton and Zanesville. At each stop the plane holds open house in the afternoon and evening for the public, to explain the uses of the plane, complete airport service to the general pilot on the lower scale at the filling station gasoline for the motorist.

## Rhode Island Aeromarines Administrator Ousted

Wilfred M. Fletcher, Rhode Island state administrator of aeronautics since 1946 and the only holder of that post since its creation, was dismissed from office recently. His immediate superior, George Drury, state director of public works, and the dismissed was succeeded by George L. Tamm, former now being succeeded by George L. Tamm, former state auditor. Albert Tamm, assistant state administrator, has been acting administrator for since Fletcher went on leave last month.

## Apple Pickup

Jackson County, Okla., residents who favor under the name of Redwood Tree and Son, probably have no more power in the nation. All American Aviation, Inc., of Pittsburgh, recently installed pickup poles similar to those at towns on the map between Cincinnati and Pittsburgh. Apples are placed in a special container. The container is placed on a nylon rope between the poles. Pilots dip low to pick up the bush while planes are traveling at 130 mph. In return for the apples the airline buys meat, sugar, coffee and magazines to families of the Redwood Tree and Son firm.

## BRIEFING FOR DEALERS AND DISTRIBUTORS

NOISE PROBLEM AGAIN—"The reason the aircraft industry is so quiet is because the airplanes are not"—Statements like this in discussions at the last meeting of CAA's non-scheduled flying industry aviation committee indicated that committee members link to development of quiet aircraft as one item in solving the persistent plane robbery's guilt. The committee, nevertheless, said that CAA Administrator T. F. Wright explained the main problem in his testimony before the President's Air Policy Commission, and that deserved Chairman William A. Moul to write to Aircraft Builders Association, Air Transport Association, and other organizations concerned, warning in strong terms of the harm being done to the future of aviation by noisy airplanes.

**POSTCARDS COME HOME TO ROOST**—Last year CAA researchers sent out several postcard questionnaires to 17,500 plane owners asking them how they used their airplanes. Post cards received from approximately 11,000 owners indicated with moderate statistical and sampling techniques a preliminary report on civil aircraft use in 1946, has been developed. It applies the analysis on a total of 55,510 airplanes, excluding planes owned by air lines and CAA aircraft registered by manufacturers but not flown in 1946, planes which are leased or chartered or dismantled, and planes registered after Oct. 1, 1946. Analysis shows an estimated total of 9,380,000 hours flown by private and non-scheduled commercial planes.

**INSTRUCTIONAL FLYING FIRST**—Instructional flying accounted to 61 percent of total hours flown, with 46 percent of the hours for personal flying and 16 percent of the pleasure flying, and 24 percent for business flying. Other uses total included transportation, 14.1 percent; other revenue-producing, 15.1 percent; and unclassified, 6 percent. The soaring an percentage was due to the fact that many of the airplanes were used for more than one purpose.

**HOURS OF UTILIZATION**—Analysis of the average number of hours flown during the year to different types showed: instructional, 264 hrs.; personal planes, 62 hrs.; business planes, 68 hrs.; transportation for less than 87 hrs.; other revenue, 75 hrs.; not classified, 32 hrs. Since it is believed in many analyses that an airplane at present costs of purchase and upkeep must be used approximately 200 hrs. a year, for economical operation, it is indicated that only the more popular aircraft exceed this figure while average personal and business plane operation fall far below. The average utilization figure, an instruction, compares with the three famous "place of origin" survey which reported (AVIATION WEEK, Oct. 13) an average of 242.2 hrs. a year among more than 300 reply by members of the Flying Farmers of America.

**NATA NATIONAL MEETING**—The 1947 membership meeting of the National Aviation Trade Association to be held at Springfield, Ill., Nov. 16, the day before the opening of the 5th National Aviation Clinic, will be utilized with interest to the aviation industry. Voting at the NATA sessions will be through three delegate delegations or their alternates but other members are being urged to attend. At the first membership gathering since last November's session of Cleveland which marked reactivation of the organization, the Springfield meeting will give indication of NATA's progress during the first difficult reorganization year. Arthur E. Conroy, NATA regional vice president, and president of the Illinois Airports and Operation Association, will be chairman of arrangements for the session, at which Beverly E. Howard, Charleston, S. C., national president, will preside. NATA will also participate in the aviation clinic sessions with five delegations in the clinic available representing schools, field base operation and aviation accessory sales.

**AIRCRAFT SHOW OF 1948**—Reading a copy of the old Shipboard magazine for May 1948, published by Fred Marshall at Dayton, Ohio, gives one a feeling of "This is where we came in." Fred tells about the big off American aircraft show at Detroit, April 14 to 21, where "some 56 types of aircraft" were on display, with entries that more than 200 airplanes were sold from the floor. It was in the nose block of the Lindbergh aviation house in those days, but neither aircraft nor airport facilities were ready to provide the public to make a "run over" market penetrable. Present aircraft have advanced quite a bit, although not enough, since those days, and there are only a few more airports, but not enough now. Maybe the President's Air Policy Commission, or the Congressional Air Policy Committee can do something about supplying the necessary ingredients through building a fire under the still lagging federal airport program and providing some government research contracts for such light plane companies as aren't too proud to accept them.

—ALEXANDER McNEILLY

# Precision "O" rings

— no larger  
than a needle's eye!

Inside diameter just  $1/16"$ ... Outside diameter only  $1/8"$ ... Cross section a mere  $1/32"$ ... Working to those narrow limits it stands to reason that nothing could serve except utmost precision. So the manufacturer who had to have perfect "O" rings in mind set came to Linear.

But strictly-held tolerances are fully as important in any size. And Linear sizes include "O" rings all the way up to  $36"$  I. O. Using finest synthetic rubber, especially developed for precision requirements, Linear assures you of "O" rings for your most severe demands—fluid-tight and gas-tight—

retaining their resistance to abrasion and a wide range of temperatures.

Maybe yours is a difficult special application, but put it up to Linear engineers. Their experience and facilities—their laboratory and operating tests—insure a finished product that's fit! Send complete data and plans to LINEAR, INC., STATE ROAD AND LEWICK STREET, PHILADELPHIA 38, PENNSYLVANIA.

\* \* \*

**NOTE:** Linear "O" rings are covered by Christopher United States Patent No. 2,180,725, all "O" rings sold by Linear are manufactured under royalty agreement with patentee.

**LINEAR**

**LINEAR**  
INCORPORATED

Executive Offices and Factory

STATE ROAD and LEWICK STREET—PHILADELPHIA 38, PENNA.

OVER THIRTY YEARS  
PIONEER EXPERIENCE

# AIR TRANSPORT



BEAUCH TWIN-QUAD IN FIRST FLIGHT

Successfully completing its first flight at Wichita, Beechcraft Model 14 Twin-Quad performed "like a veteran" Vice Captain Beech said test pilot reported. The 20 passenger plane has two Lycoming engines rated at 375 hp. each for takeoff, and two propellers. Model 14 is designed as a day-coach and air carrier with seats for 2,400 cubic inches of luggage. It has a maximum speed of 145 mph at high altitude, passenger miles per gal. of fuel, or 23.6 gross ton miles per gal. at 180 mph. cruising speed, as reported by Beech engineers. Plane is designed for quick changeover from passenger to cargo space. (AVIATION WEEK, July 7.)

## Domestic Trunklines to Show Substantial 3rd Quarter Profit

Deficit for first nine months of 1947 still at record level despite traffic comeback and good earnings during latter part of August and September.

By CHARLES ADAMS

The domestic airlines, which were set back by unexpected early summer base rate decisions, made a strong recovery during the latter part of August and September, boosting passenger traffic to record levels and striking up substantial profits.

But the favorable progress in the past two months will not prevent the carriers from entering the last quarter of 1947 with unbalanced losses. On Sept. 30, 1946, the 16 companies were about \$4,183,000 in the black, while on the same date this year they probably will show an operating deficit aggregating at least \$10,000,000.

**1946 Comparison.**—During the first six months of 1946, the domestic trunk lines earned about \$880,000, boasting this figure as \$1,775,000 by the end of July and \$4,063,000 by Aug. 31. The carriers in September need the same month operating profits to about \$4,183,000.

This year, the carriers had a \$16,000,000 deficit in the first half and last another \$435,000 in July. Preliminary

figures indicate an operating profit of about \$2,500,000 in August, which, along with September, was characterized by exceptionally good flying weather.

**1947.**—**Q3.**—Passenger traffic in August, for the third straight month, was behind the level of the preceding year. Prior to this date, traffic had passed over the corresponding month of the previous year for 45 consecutive months (AVIATION WEEK, Aug. 21).

Last year, revenue passenger mileage was about \$81,000,000 in June, \$70,000,000 in July and \$24,000,000 in August. This year, the figures were June \$18,000,000, July \$74,000,000 and August \$61,000,000. During the first six months of 1947, passenger traffic was up 10 percent over the same period last year, but the July and August totals brought the gain for the first eight months down to less than 6 percent.

**Q4.**—**Goals.**—**Over Railroads.**—While the airlines' passenger incomes have been far below the 25-35 percent gains forecast

by some industry optimists, they do reflect a rise in the use of air travel compared with other forms of transportation.

The Air Transport Association reports that the domestic airlines' 10 percent gain in revenue passenger miles during the first half of 1947 contrasts with a 45 percent decline in Pullman passenger miles and a 36 percent drop in day coach travel on class 1 railroads. Industry bus passenger miles dropped over 4 percent in the same period.

► **Revenue Rate-Per-Diagram** increases of the domestic airlines were up 15 percent in first half 1947 compared with 1946, while railroad passenger revenue fell 11 percent. ATA pointed out that airline passenger revenue is now running close to 18 percent of Pullman and day coach revenue.

Operating expenses in domestic air transportation increased 35 percent in first half 1947 over the same 1946 period, while rail and bus operating expenses were up about 5 percent. Total airline operating revenue, including passenger, mail and cargo income, gained 10 percent, against 16 percent for the railroads and a 12 percent decline for bus operators. Airline freight revenue was up 180 percent and air express revenue 52 percent, compared with a 28 percent gain in railroad freight revenue and a 16 percent rise in railroad express income.

► **NWA Progress.**—Business outlook for the domestic airlines, according to Carl Hester, president and general manager of Northwest Airlines, is brighter than ever before. His statement coincided with an announcement that NWA in August had the largest business in the last four months.

Hester and NWA's Alaska and Orient operations are already in the black, with traffic exceeding estimates. Domestically, the carrier had a 31.45 percent load factor in August and reported continued good business through September.

► **Midwest Statesmen.**—Western Air Lines President T. C. Dinkwater recently told stockholders that his company's earnings trend should wipe out the heavy first quarter deficit and substitute a profit for the remainder of the year. WAL made a \$120,000 profit during the first quarter on a 55 percent load factor.

► **String.**—The carrier's load-even load factor had been reduced to 60 percent. Dinkwater announced continued profits in July and August on load fac-

tons of 66 and 77 percent, respectively. CAB's approval of Western's Los Angeles Division move site to United Air Lines for \$3,751,000 has enabled UAL to retire its maximum debt, loans and increase its working capital.

**Answers the Demand**—PAA's through-lease lease American Airlines with an eight-month operating deficit of \$2,187,880; Board, \$671,000 deficit; Chicago & Southern, \$646,000 deficit; Delta, \$264,000 deficit; Mid-Continent \$119,000 profit; National, \$735,000 deficit; Northwest, \$81,000 deficit; PAA, \$2,497,000 deficit; TWA, \$3,581,000 deficit; United \$1,836,000 deficit. Six-month operating results are: California \$604,000 deficit; Continental \$532,000 deficit; Eastern \$1,167,000 profit; Illinois \$77,000 profit; Northwest \$1,064,000 deficit; Western \$392,000 deficit.

On the Trans-Atlantic side, Pan American's deficit is \$2,293,000; Pan American's profit is \$1,477,000 deficit in the first seven months of 1947. American Overseas Airlines is \$1,187,000 in the red during the first eight months.

In other overseas and international operations Northwest had a \$14,000 profit as its route in Alaska and the Orient in the first seven months and United a \$266,000 profit as its link to Hawaii during the same period. PAA's Latin American division reported a \$1,880,000 operating loss through July, but the carrier made \$2,159,000 on its Pacific operations and \$577,000 on its Alaska services.

## Northwest, PCA Get New Routes

Northwest Airlines' long-awaited extension from Detroit to Washington, D. C., was granted by CAB this month in one of a series of decisions which also gave Capital Airlines (PCA) a link from Milwaukee, Wis., to Minneapolis-St. Paul.

Chicago and Pittsburgh are included in an intermediate package on the 399-mile addition to Northwest's route. Fred Hunter, NWA president, said his company will begin preparing soon, especially for the new segment, which will permit out-of-concourse operations from Washington in the Pacific Northwest, Alaska and the Orient.

**► Applicant Since 1941**—Northwest has been trying to gain entrance to Washington since 1941. Abilities of Cleveland, Pittsburgh and Washington bring to 41 the number of cities on the carrier's domestic and international routes.

In certifying Northwest into Washington, CAB specified that moves east of Milwaukee be handled by flight segments from Minneapolis-St. Paul, or points further east, and terminating at

Term, to the terminal plant Kansas City, Mo., via Springfield, Mo. Applications of Board, Delta, Eastern and Mid-Continent for the same route were denied. Chicago, Cleveland, Louisville and another low demand selection of NCA. All bids for additional service between Memphis, Atlanta and Florida were denied.

In other parts of the far operation, the Board:

- **Designated Toledo, O.** as a new intermediate point between Cleveland and Detroit on PCA's route 14.
- **Revised** from United Air Lines' route 1 certificate the restriction preventing service to both Detroit and Cleveland on the same flight.

- Denied application in TWA United and Eastern for new transline service to Pittsburgh. The bids were pending in the Middle Atlantic area and declined prior to a decision on the re-opening of the bidding because of related action in the Detroit Washington case.

- Granted Eastern Air Lines' application for consolidation of the Birmingham-Columbus-Atlanta segment of route 5 with route 10 to provide a more direct through service from Memphis to Atlanta, Jacksonville and other east Florida points.

## Mail Rate Proposed On Braniff Overseas Run

Braniff Airlines will receive 95 cents a plane mile mail per, when it arranges service to Latin America if CAB places an effect temporary rate prior to this month. The carrier had asked for \$1.51 a plane mile.

CAB said base mileage for setting a temporary rate will not be established until the end of three months scheduling a week between Houston, Tex., and Leon, Peru, "Beyond Loss," the Board declared. "Operational difficulties and uncertainties as to the effective date and nature of operating rights are such that the base mileage should not include any subsidies until problems are eliminated to the extent that Braniff can demonstrate a feasible operating plan." Braniff's Latin American route, granted in May, 1946, extends beyond Leon to Rio de Janeiro and Buenos Aires.

## High Costs Hit UAL

United Air Lines had suspended plans for building a new hangar at Board's expense of \$100,000, largely without estimate. President W. E. Patterson said he was doubtful if the company will in fact carry out such a costly plan. Estimated cost of the company's new Chicago hangar was \$79,000, but with the project only 70 percent completed it has required \$2,100,000.

EVER SEE A PROPELLER ON THE *Side* OF A SHIP?



WELL, HERE IT IS  
and it says **SENSENICH**  
on every blade!



Prompt Repair Service—of all makes of wood propellers—from Sensenich's PROP-SHOP.

SENSENICH CORPORATION • Main Plant, LANCASTER, PA. • West Coast Branch, GLENDALE, CALIF.

AVIATION WEEK, October 20, 1947

## ALINES

Jim:  
Here's the information  
you wanted on Mareng fuel  
cells. No doubt about it,  
they increase the dependability  
and availability of our  
Martin 2-0-2's.

Tom



Flexible Mareng dual cells, another Martin development, are easily slipped in and out of the Martin 2-0-2's wing access hatch. This eliminates wing rear-down. Reduces maintenance time and cost.

## Here's How Flexible Mareng Fuel Cells Cut Costs, Increase Dependability of the Martin 2-0-2

### LEFT WING PANEL OF MARTIN 2-0-2



The four interconnecting Mareng fuel cells in each wing panel provide safe, dependable storage for the 2-0-2's gasoline. The individual cells eliminate the need for excessive riveting, rare-case corner assemblies or troublesome metal work. Makes inspection, repair, replacement easy.

### CROSS SECTION OF MARENG FUEL CELLS

Cross access doors, molded on stand, bellows and flexible. These Mareng fuel cells are leak-proof under severe distortion or vibration. Results in increased dependability and lower maintenance cost on the Martin 2-0-2. The Glenn L. Martin Company, Baltimore 3, Maryland.



### OTHER SPECIAL FEATURES OF THE MARTIN 2-0-2 INCLUDE—

1. 280 mph crusing speed.
2. Unrestricted loading — superior C.G. range.
3. Shorter runway requirements.
4. Aerodynamically superior wing, flaps and ailerons.
5. Heat anti-icing.
6. Automatic propeller feathering.
7. Built-in landing range.
8. Underwing fueling.
9. Easily accessible servicing hatches.

**Martin**  
AIRCRAFT

Member of Republics Aircraft Group



### AMBASSADOR IN FLIGHT

Engaged in long-distance or freight-carrying type aircraft is the Aeroplane "Ambassador," shown for the last time at the Rediff air show. Features include 280 mph. crusing speed, seats for 40 passengers, pressurized cabin, thermal insulation, reversible prop., and laminar flow high speed wind design. Range is 1,000 mi. with reciprocating engines and 2,300 mi. with turboprops (estimated). (World's Newsphoto)

## Pilots Support Flight Engineers

Management now fears that  
drives is underway to "Teacher-  
hood" in air transportation.

The Air Line Pilots Association and other unions took their arguments for additional flight crew members on four-engine aircraft into a CAB hearing that month as management representatives voted fear that a drive is underway to establish "doubledecking" practice in air transportation similar to that in operating on the railroads.

In urging Civil Air Regulation requiring a flight engineer on all four-engine aircraft now operating with a two-man crew and that all new four-engine aircraft be required to have a steward for the added time in the cockpit, Kevin Sherry, spokesman for the association, said it still would be a great contribution to airline safety if a non-pilot member is able to furnish an additional pair of eyes outside the cockpit, Wood said.

**Too Many Gadgets**—For several years pilots have voiced with alarm and consternation the cost increasing tendency to pile gadgets on top of gadgets which in turn will work other gadgets. The increasing size and complexity of the modern airplane, and the difficulties involved in its operation under present complicated traffic control procedures, with multiple airports and landing and takeoff, are problems which can no longer be ignored.

Wood said the total DC-6 check list contains of 191 items to be checked or written in each flight. From these two men, flight crews differ varying considerably. He added that the cockpit of both the DC-4 and DC-6 is to wide

that many important knobs and controls are hard to reach in a hurry.

**Complaints**—Glen (Left) Green (including those not covered by the check list) which require the pilot's attention to the point of causing him to neglect other areas. He said, however, that the pilot's concern from the standpoint of safety is to the flight engineer, leaving 334 under direct supervision of the pilot.

Wood asked that an additional crew member be required on all four-engine aircraft now operating with a two-man crew and that all new four-engine aircraft be required to have a steward for the added time in the cockpit. Kevin Sherry, spokesman for the association, said it still would be a great contribution to airline safety if a non-pilot member is able to furnish an additional pair of eyes outside the cockpit, Wood said.

**TWU Position**—A representative

of

the International Transport Workers Union of America (TWU) declared that every aircraft with four or more engines flying over water or long land distances should have, in addition to the pilot and co-pilot, a flight engineer, navigator and radio officer. He said opposition to such a new composition comes not only from the airlines and ATA but from certain pilot groups.

The Transport Workers Union declared that management has "either within CAB and CAA when they are able to influence and pressure." The union was withdrawn upon the pre-

sent of CAB Chairman James M. Lewis and Vice Chairman Arnold Ryan.

Arnold Ryan, ATA Vice President Milton W. Arnold and present Civil Air Regulation adequately provide for the guidance of CAB and the operation when use of a flight engineer, navigator or radio operator is necessary. At present, the minimum flight crew for an aircraft is established at the time the plane is built.

"In view of the many variations in operations, we maintain it is not practicable for CAB to write more detailed regulations as to crew complement than are now prescribed in parts 64(b), 44, 46 and 61," Arnold declared. "It is up to us as the airlines that are complement inherently the perspective of management, and the Government should not attempt to make all-inclusive regulations."

**Pro-Teacherhood Period**—"When considering the safety problem, like many others, it is essential that CAB proceed carefully in order to avoid guessing, in the game of safety regulation, the purely academic desire of airline employees."

Immediate hearing of the segments for an additional flight crew member—particularly as engineer—on four-engine aircraft was urged on CAB in August by the Pennsylvania Safety Board. CAB's safety bureau has also recommended amendments to part 64(b) of the Civil Air Regulation requiring that a flight-engineer station be provided on all long-haul planes certified after Dec. 31, 1948.

## AOA Returns Planes Leased From Army

Negotiations in the American Defense Defense pilot strike have bogged down after bills with a number of the National Defense Board. The strike has turned back to the Army three C-54s which it has been leasing and has offered its own 18 planes to other Trans-Atlantic operators for use until the strike is settled. Constellations are being offered at \$750 per day plus \$35 per hour flying time. DC-4s are offered at \$950 per day plus \$30 a flying hour.

Company officials have discussed the steadily gravitating with the plan but expect no progress towards settlement of the strike.

## Food Conservation

The Air Transport Association has announced that the scheduled domestic airlines will stop serving meat on Tuesdays and eggs and poultry on Thursdays in accordance with the Government's food conservation program. Withdrawal of bread from airline menus also is contemplated.

## TRANSPORT

## CAB Grants Rights To Six Cargo Lines

Six cargo lines have been granted permission to engage in cargo carrier operations pending CAB decisions on their applications for air cargo. Companies receiving letters of registration this month were: Wells Air Service, Teterboro, N. J.; Michael Aviation, Inc., Buffalo, N. Y.; Air Cargo Transport Corp., New York; California Eastern Airlines, Oakland, Calif.; The Flying Tiger Line, Buffalo, Calif.; and Riddle Aviation Co., Coral Gables, Fla.

Four other companies—Globe Freight Airline, Stock Aviation, Flying Air Service and U.S. Airline—previously were granted letters of registration. The request of Bokair Van Lines Co., Los Angeles, was denied, and 32 applications are still pending. Of the ten companies granted common carrier privileges, Stock, U.S. Wells, the Flying Tiger, Air Cargo Transport and California Eastern operate lines confidentially.

U.S. Aviation's letter of registration permits common carrier service to 12 different points. Stock, 26 points, Wells 18 points, Flying Tiger 16 points and the "Massachusetts," the Flying Tiger 34

points. Air Cargo Transport 17 points, Globe 16 points between Seattle and New Orleans, California Eastern 5 points, Riddle Aviation 4 points between New York and San Jose, and Mutual 2 points—New York and Buffalo. The six carriers operate more than 60 planes, including C-46s, C-45s, C-47s, Lockheed Lodestar and Budd Consignment.

## J. J. O'Brien Leaves California Eastern

J. J. O'Brien, president and director of California Eastern Airways, trans-continental all-cargo line, has submitted his resignation to the board of directors. O'Brien's personal development

► **American Airlines**—George H. Evans Jr. formerly assistant general manager has been appointed vice-president of sales.

► **American Overseas**—Robert W. Morris, formerly manager of the New York office, has been named assistant traffic manager for Berlin, replacing Harry F. Koenig, who becomes director traffic manager in Newark.

► **Brussels**—M. Thivierge has joined the airline as manager.

► **Calcutta-Bombay**—Japan 31 has been elected vice-president. He joined the company in 1948 and currently has been assigned to the private office.

► **Canton**—John Updegraff has been appointed vice-president. He joined New York Alexander in 1946. New York Alexander, H. J. Hirsch, Mihaly, L. D. Bowers, C. E. P. Hirsch, G. S. Abbott and W. E. Davis are directors.

► **Fin. American**—H. Spencer Garrett has been appointed manager of the Miami-based sales office.

► **Freight Airlines**—Allison Sherrill has been appointed traffic manager to Atlanta, Ga., Atlanta.

► **West Coast**—Robert L. Johnson, formerly manager of the San Francisco traffic manager to the San Francisco office and sales manager, San WCA.

## CAB SCHEDULE

Oct. 19: HEARING ON AMERICAN AIRLINES TO CANTON-BOMBAY AIRLINES (Docket 1918)

Oct. 19: Hearing on Pan American Airways application for route connecting from San Francisco to Latin America (Docket 1911)

Oct. 20: Preliminary conference on adding the San Francisco sales service (Docket 1911-41-1)

Oct. 20: Hearing on Pan American Airways application for route connecting from San Francisco to Latin America (Docket 1911-41-1)

Oct. 20: Oral argument on TWA Delta application for route connecting to Argentina (Docket 1911-41-2)

Oct. 20: Hearing on Pan American Airways application for route connecting from San Francisco to Latin America (Docket 1911-41-3)

Oct. 20: Oral argument on TWA Delta application for route connecting to Argentina (Docket 1911-41-3)

Oct. 20: HEARING ON BOLIVIAN AIR SERVICE application for route connecting from San Francisco to the Bolivian-Chilean border (Docket 1911-41-4)



# How AiResearch aids the RECORD-BREAKING JETS

When Navy pilots smashed the world's speed record last August over the scorched deserts of Mojave, California, a rugged AiResearch turbine refrigeration unit saved snow flakes and ice the cockpit of the Douglas jet-powered D-558 Skymariner.

During the first runs which averaged 640.7 m.p.h., skin temperatures of the Skymariner, lashed by air friction and heat of the sun, were about 160 degrees F. Bleed air from the jet engine, source of air for the radice, was a soaring 450 degrees. Yet the AiResearch turbine discharged air into the cabin between 30 and 40 degrees, keeping cabin temperature at approximately 50°.

Thus the extreme cockpit temperatures encountered today in high-speed propeller planes are being successfully controlled by rugged AiResearch turbine refrigeration units. For the past eight years that company has pioneered the field, designed and built the first experimental models, and is today equipping a major share of all jet-propelled airplanes under construction or flying in the United States.

In addition, AiResearch leads in the field of complete air conditioning and cabin pressurization systems for Army, Navy, and commercial aircraft. Call upon this unusual background of skill and experience to help solve your aircraft air conditioning problems.

AIRESEARCH MANUFACTURING COMPANY  
LOS ANGELES 45, CALIFORNIA

### PARTIAL LIST OF JET AIRPLANES USING AIRESSEARCH CABIN PRESSURE AND REFRIGERATION EQUIPMENT

CABIN REFRIG. PRESSURE EQUIPMENT
Consolidated XB-46
Consolidated XP-87
Convair XP-57
Douglas XB-43
Douglas D-558 (Navy)
Lockheed P-268
Martin XB-48
McDonnell XF-85-1 (Navy)
North American F-86
Northrop YF-49
Republic P-84



Sales Representatives: NEW YORK: Aero Engineering, Inc.; Binghamton Field, Binghamton, N. Y.; NEW YORK: C. & H. Supply Company, 2710 First Ave. E., NEW YORK, N. Y.; Chicago: 212 E. Gilbert

**AiResearch**  
TURBINE  
REFRIGERATION  
SYSTEMS  
THE GARRETT CORPORATION



THE WAR-BORN  
AIRCRAFT FRESHENER  
THAT MADE GOOD!

HERMAN NELSON  
PORTABLE GROUND HEATERS FOR COMMERCIAL AIRCRAFT

Thousands of units, with millions of hours of service, have proved the worth of Herman Nelson Portable Heaters of air busses and parts throughout the world. Designed originally for the Army Air Forces, these Heaters are now available in improved commercial models for heating of aircraft engines, instruments, cables and switches.

Combat cold weather maintenance, repair and warmup difficulties this winter by using this reliable source of quick, clean, safe HEAT. Herman Nelson Portable Ground Heaters are regularly in use on some of the nation's largest airlines.

Write today for catalog and prices.

**THE HERMAN NELSON  
CORPORATION**  
MOLINE  
ILLINOIS  
SINCE 1916 MANUFACTURERS OF SANITARY HEATING AND VENTILATING PRODUCTS







## So The War Goes On

AVIATION WEEK on Sept. 29 deplored the fact that four major airlines had signaled their intention to undercut cargo rates charged by independent freight airlines. CAB permitted the rates to go into effect. We pointed out that the independents' only income is from commercial traffic. They income no Government mail pay and no passenger fares. If their rates are unacceptable, these freight lines must inevitably go out of business. The public's pocketbook is unaffected. From a public admissions standpoint it is *all above* has been to the interest of the major air carriers to let the freighten climate themselves.

Instead, however, several big lines announced still lower rates, obviously to win the independents' set of business in a hurry. They chose the moment when a special commission of the President of the United States is trying to find among other things, how to keep the maximum number of commercial aircraft flying in this country without Government subsidy, as the taxpayers can be relieved of supporting at least some part of a military transport fleet. These airlines also chose the very time most of the established air transport industry seeks higher mail rates and when increased passenger fares are under discussion.

CAB is within its rights in letting the new rate structure stand. It is definitely right in ordering a thorough investigation. But it is now under solemn obligation to make that investigation while there is still an independent air freight industry. There are not many of us so naive as to believe that such immediate action will be forth coming from CAB. Thus, the continuing concern that CAB is more a protector of the established certificate holders than it is an impartial public agency is bound to grow, space and wind up in more aling of airline matters in high places. The action of a few ill-informed airline executives will have started a whole series of dangerous and needless developments which may well have crippling effect on the world's freight airline system. We can not believe that the old established carriers, guaranteed by the Civil Aeronautics Act against unfair rates could have suffered irreparable loss from the cargo carriers, or could not have waited a few more months for their sound competition—if they are uninsured—it is out of business.

As for CAB's contention that air mail pay is based entirely on the evaluation of the public service, without regard to an airline's other income, it may be legally valid. But no one familiar with the facts of life in the air transport business believes that unusual operations in cargo are unrelated to "fair income" from mail.

So, in just a few months a few men have herself off what could be a serious conflagration.

The action may well have important repercussions on Capitol Hill, in the President's Air Policy Commission, and in propaganda broadcast to the steamer and rail roads.

Already the publication of the Federation of Railway Progress is saying:

"In Washington, the Air Transport Association's Adm. Envoy S. Land was talking up the development of new types of air cargo planes on a large scale. It would be nice if the Government would sponsor such a program, he told the President's Air Policy Committee. Elsewhere, airlines were asking for permission to cut air cargo rates, and for increases in the amount of money they get for carrying the air mail."

And RAILWAY AIR quotes from a report by the rail roads' industry's subcommittee on air transport of the Railroad Committee for the Study of Transportation as follows:

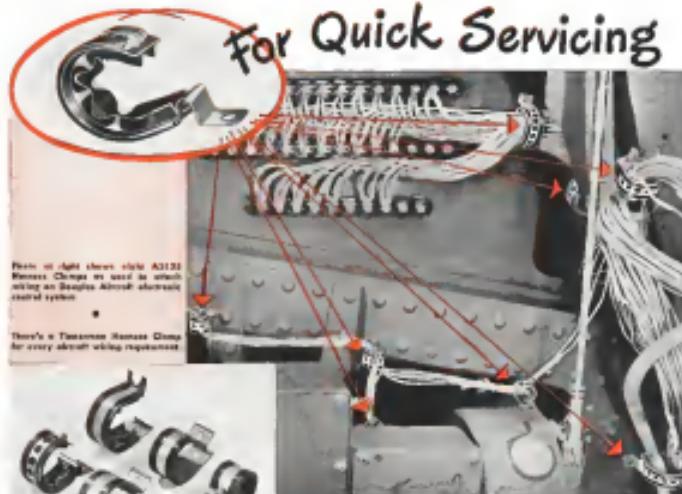
"Present freight rates of both the scheduled and non-scheduled lines are on a 'below cost' basis, as many cases being 'in' low or lower than the charges for first class rail express." The report added that such rates are made possible by "subsidies and other public aids" — but even with such aids many of the carriers are operating at a loss. The certificate carriers had assurance that any mail and air rates would have been adjusted. The independent had no government assurance on anything.

Such comments are bound to multiply. As long as the airlines maintained their semblance of economic rates on cargo they were in stronger position to fight for and win higher fares and Government mail rates. By adopting cut rates on freight, for selfish statistic, which they cannot support while they lose money on other operations, they readily the writers and put themselves in an unless bargaining position which cannot do anything but harm the nation's airtime system.

As for CAB's contention that air mail pay is based entirely on the evaluation of the public service, without regard to an airline's other income, it may be legally valid. But no one familiar with the facts of life in the air transport business believes that unusual operations in cargo are unrelated to "fair income" from mail.

So, in just a few months a few men have herself off what could be a serious conflagration.

## TINNERMAN HARNESS CLAMPS



**TINNERMAN A3125 HARNESS CLAMP** has unique advantages in wiring all types of aircraft. It has a latching tab which works independently of the attaching screw, permitting removal or replacement of wires without loosening the screw.

Once attached to the wire, it may be opened open or closed by hand—saving hours of time in wiring service. Two latching stations are provided to accommodate varying thicknesses of wire bundles, thus reducing the number of stock sizes. The interior of the extruded synthetic channel is ribbed to provide a firm grip on harness and eliminate friction chafing.

A3125 HARNESS CLAMPS are available for harness lines from 16<sup>2</sup> to 16<sup>1</sup>. Made of SAE 1060 steel, heat-treated, with a rust-proof finish and extruded synthetic channel. Write for samples, prices and engineering data.

**TINNERMAN PRODUCTS, INC.**  
2210 FULTON ROAD  
In Canada: McLean Products Co. Ltd., Markham, Ontario  
In England: Standard Aeroplane Components Ltd., London

**Speed**  
MORE THAN 4000



In France: Aeroplane Components, E.A., Paris  
In Australia: Aeroplane Components Pty. Ltd., Melbourne

In Mexico: Aeroplane Components, S.A. de C.V., Mexico

SHAPES AND SIZES

16<sup>2</sup> to 16<sup>1</sup>

16<sup>1</sup> to 16<sup>1</sup>

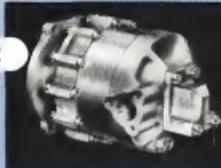
*Service of Supply*  
FOR JET ENGINES



DUAL

**DOWTY**  
Fuel Pumps

DUPLEX



SINGLE



Dowty Fuel Pumps deliver 600 to 1,320  
Imperial gallons per hour at 3,500 r.p.m.  
and 1,000 lbs. per square inch pressure

For U.S.A.  
manufacturing  
licences  
apply to

DOWTY CORPORATION · 25 BEAVER STREET · NEW YORK 4 · N.Y.  
DOWTY EQUIPMENT LIMITED · CHELTENHAM · ENGLAND  
DOWTY EQUIPMENT (CANADA) LIMITED · 999 AQUEDUCT ST. MONTREAL 3 · CANADA